Steering

Repairs and maintenance

Section	Group
6	64

Steering
1975-
240/260

VOLVO

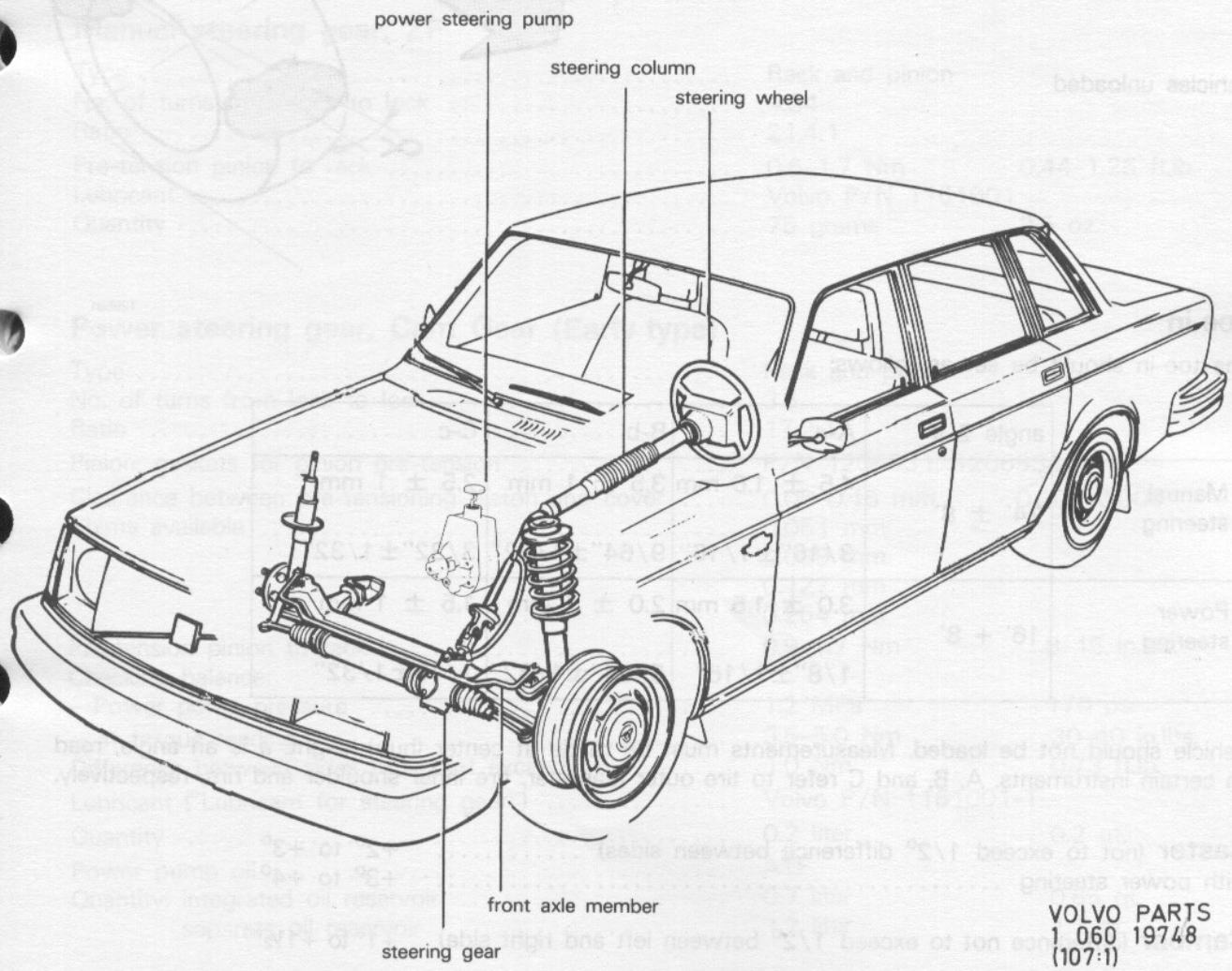
Contents

TP 30001/3
4500.8.84
Printed in U.S.A.

Group 64

Steering

1975-



VOLVO PARTS
1 060 19748
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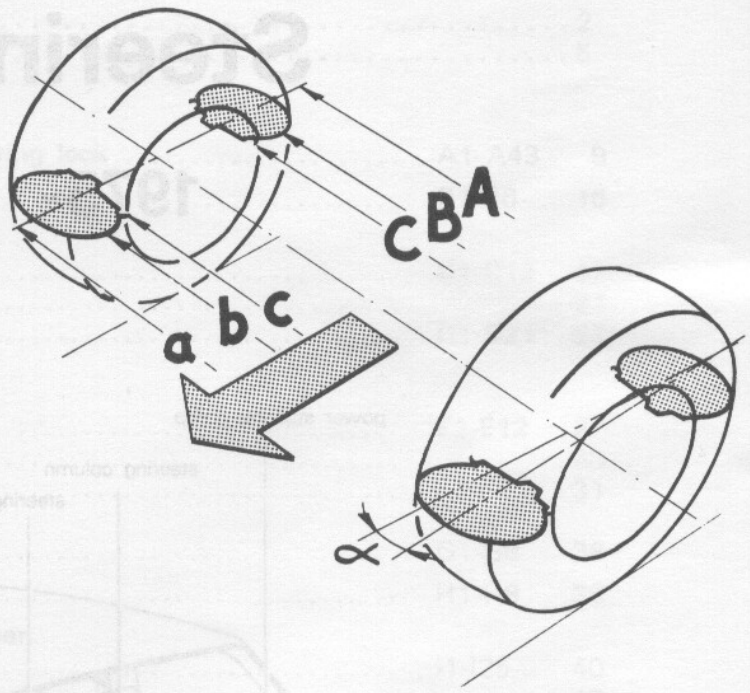
Specifications

Front end alignment



129581

Vehicles unloaded

Toe-in

The toe-in should be set as follows:

	angle 2 *a*	A-a	B-b	C-c
Manual steering	24' ± 8'	4.5 ± 1.6 mm 3/16"±1/16"	3.5 ± 1 mm 9/64"±1/32"	2.5 ± 1 mm 3/32"±1/32"
Power steering	16' + 8'	3.0 ± 1.5 mm 1/8"±1/16"	2.0 ± 1 mm 5/64"±1/32"	1.5 ± 1 mm 1/16±1/32"

Vehicle should not be loaded. Measurements must be made at center (hub) height. *a* is an angle, read on certain instruments. A, B, and C refer to tire outer diameter, tire inner shoulder and rim, respectively.

Caster (not to exceed 1/2° difference between sides) ..... +2° to +3°
with power steering ..... +3° to +4°

Camber (difference not to exceed 1/2° between left and right side) +1° to +1½°

Manual steering gear, Cam Gear

Type	Rack and pinion	
No of turns from lock to lock	4.34	
Ratio	21.4:1	
Pinion: pre-tension	0,1 mm	0.004"
shims available	0.127 mm	
	0.191 mm	
	0.254 mm	
Clearance between pre-tensioning piston and cover	0.002–0.15 mm	0.0008–0.006"
Shims available	0.127 mm	
	0.254 mm	
	0.381 mm	
	0.508 mm	
Pre-tension pinion to rack	0.6–1.7 nm	0.44–1.25 ft.lb.
Lubricant (grease)	Volvo P/N 1161001	
Quantity	75 grams	2.5 oz.

Manual steering gear, ZF

Type	Rack and pinion	
No. of turns from lock to lock	4.34	
Ratio	21.4:1	
Pre-tension pinion to rack	0.6–1.7 Nm	0.44–1.25 ft.lb.
Lubricant	Volvo P/N 1161001	
Quantity	75 grams	2.5 oz.

Power steering gear, Cam Gear (Early type)

Type	Rack and pinion	
No. of turns from lock to lock	3.5	
Ratio	17.2:1	
Pinion: gaskets for pinion pre-tension	P/N 1206931, 1206934	
Clearance between pre-tensioning piston and cover	0.05–0.15 mm	0.002–0.006"
Shims available	0.051 mm	
	0.089 mm	
	0.127 mm	
	0.254 mm	
Pre-tension pinion to rack	0.9–1.7 Nm	8–15 in.lbs.
Checking balance:		
– Power pump pressure	1.2 MPa	170 psi
– at torque reading	3.5–5.0 Nm	30–40 in.lbs.
Difference between sides must not exceed	1.0 Nm	0.73 ft.lb.
Lubricant ("Lubricant for steering gear")	Volvo P/N 1161001-1	
Quantity	0.2 liter	0.2 qt.
Power pump oil	ATF	
Quantity: integrated oil reservoir	0.7 liter	0.65 qt.
separate oil reservoir	1.2 liter	1.1 qt.

Power steering gear, ZF (Fixed Valve Housing)

Checking balance:		
– Power pump pressure	2.0 MPa	285 psi
– at torque reading	4–5.5 Nm	35–40 in.lb.
Difference between sides must not exceed	0.5 Nm	4.4 in.lb.

Power steering pump, ZF

Type	Vane pump	
Max. pressure, early prod.	7.5 MPa	1070 psi
late prod.	5.8 MPa	820 psi
Theoretical capacity at 500 rpm	6.65 liter/min	6.24 qt/min
Drive	Belt drive	
Drive ratio, engine to pump	1:1	

Power steering pump, Saginaw

Type	Vane pump	
Max. pressure	5.5–7 MPa	780–995 psi
Theoretical capacity at 500 rpm	5 liter/min	5.3 qt/min
Drive	Belt drive	
Drive ratio, engine to pump	1:0.9	

Torques

Steering	**Nm**	**ft.lb.**
Steering wheel center nut	60±15	44±11
Screws, steering column attachment	20±5	14±4
Screws, steering shaft rubber coupling	20±5	14±4
Screws, steering shaft joint	23±5	17±4
Screws and nuts, steering gear to front axle	20±5	14±4
Nut, tie rod to ball joint	70±10	51±7

Manual steering gear, ZF

Pinion nut	24±2	17±1.5

Manual steering gear, Cam Gear

Screws, pinion cover	19±2	14±1.5
Screws, pre-tensioning device cover	19±2	14±1.5

Power steering gear, Cam Gear

Screws, pre-tensioning device cover	19±2	14±1.5
Screws, upper pinion cover	19±2	14±1.5
Screws, lower pinion cover	19±2	14±1.5
Lock screws, outer tube to housing	19±2	14±1.5
Lock nut, pinion	14±1	10±0.75
Fittings, pressure hoses and return hoses	42±7	30±5

Special tools

When ordering tools, put 999 in front of 4-digit tool number.

1801 **Standard handle**

1819 **Bearing puller**

2263 **Steering wheel puller**

2520 **Work stand**

2734 **Drift**
installing seal

2863 **Drift**
installing seal

2993 **Drift**
installing rack bushing Cam Gear manual steering gear

4078 **Puller**
rack bushing

5043 **Puller**
tie rod end

5046 **Fixture**
steering gear overhaul

5047 **Puller**
for bearing

5048 **Drift**
installing bearing

5049 **Sleeve**
adjusting balance

5051 **Puller**
bearing and seal

5052 **Drift**
installing bearing

5053 **Adapter**
checking pinion torque

5054 **Cover**
adjusting balance

5055 **Pressure gauge**
balance and oil pressure

5056 **Sleeve**
installing seal

5119 **Wrench**
lock nut, pinion upper bearing, ZF steering gear

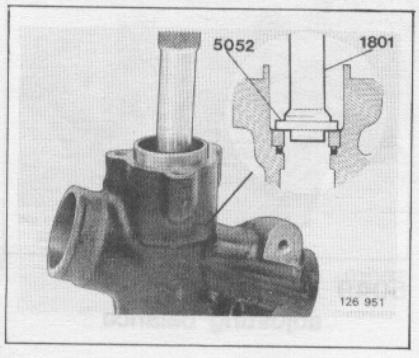
5175 **Nipple**
checking balance

5176 **Nipple**
checking balance

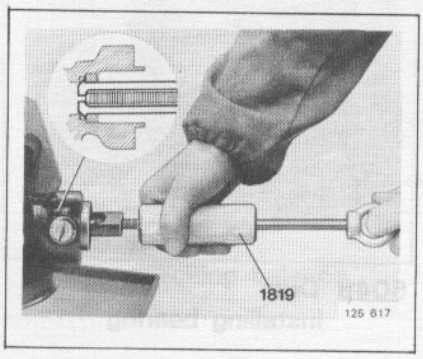
5179 **Adapter**
checking balance

5182 **Adapter**
installing cover

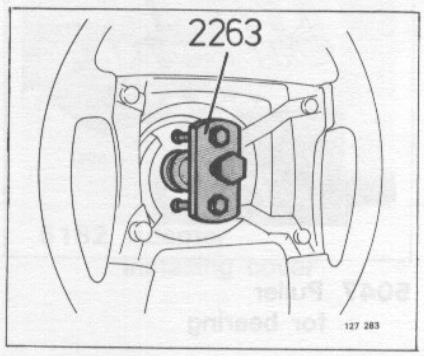
9177 **Torque gauge**



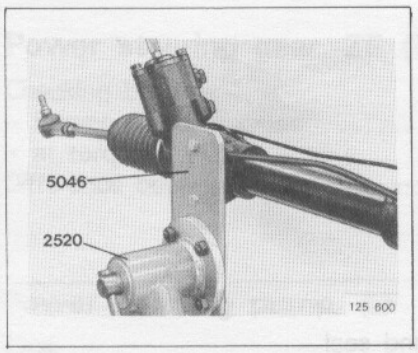
1810 Standard handle



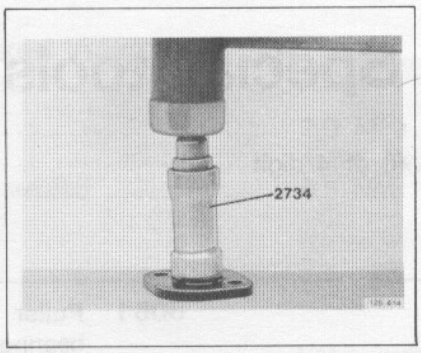
1819 Bearing puller



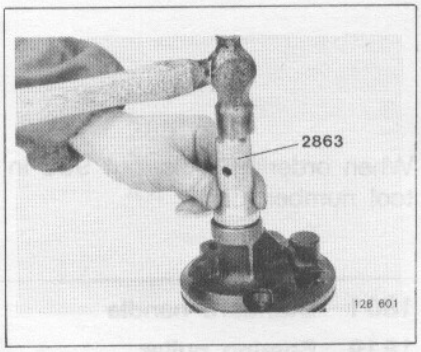
2263 Steering wheel puller



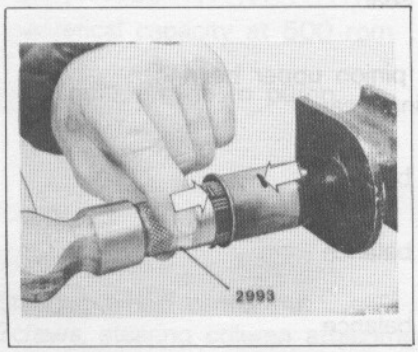
2520 Work stand
5046 Fixture
steering gear overhaul



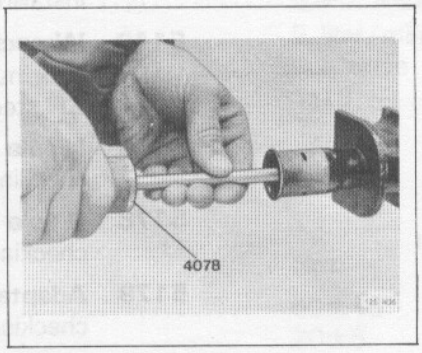
2734 Drift
installing seal



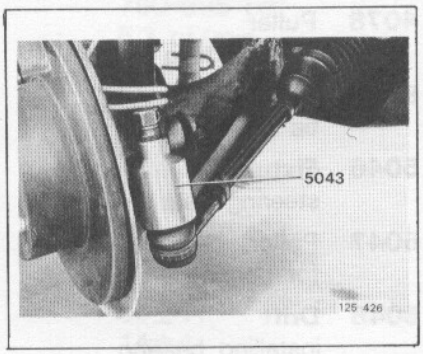
2863 Drift
installing seal



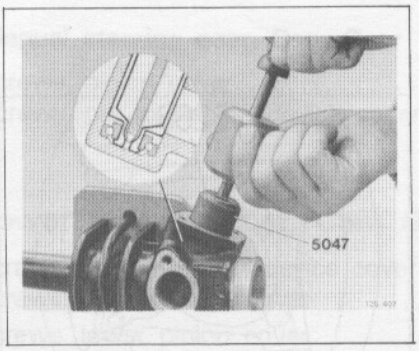
2993 Drift
installing rack bushing,
Cam Gear



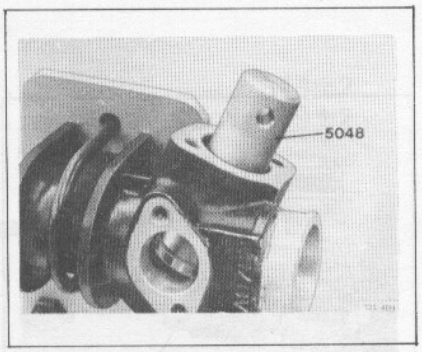
4078 Puller
rack bushing



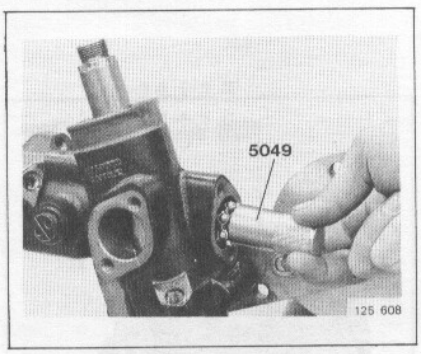
5043 Puller
tie rod end



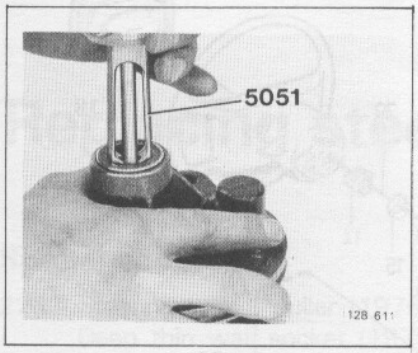
5047 Puller
for bearing



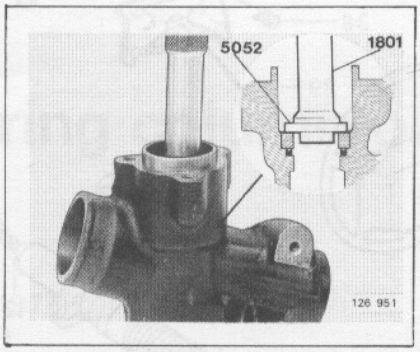
5048 Drift
installing bearing



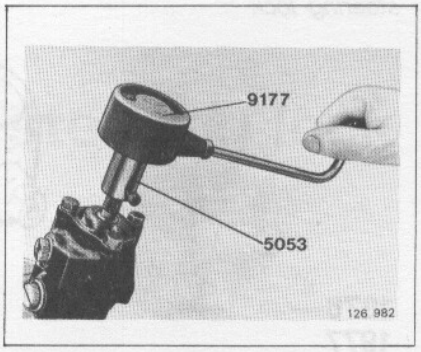
5049 Sleeve
adjusting balance



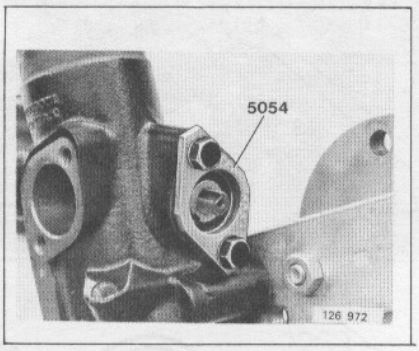
5051 Puller
bearing and seal



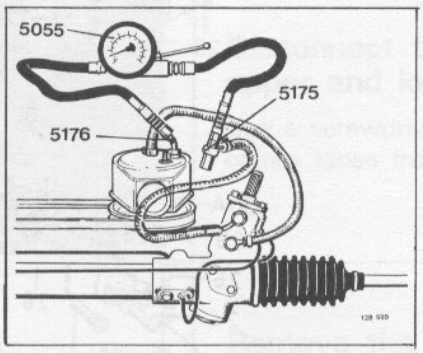
5052 Drift
installing bearing



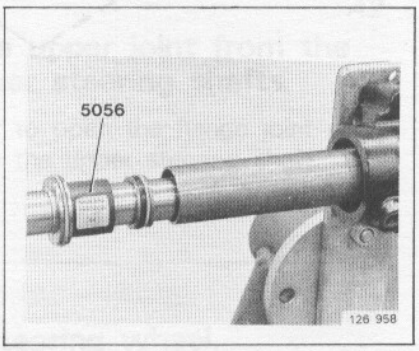
5053 Adapter
checking pinion torque
9177 Torque gauge



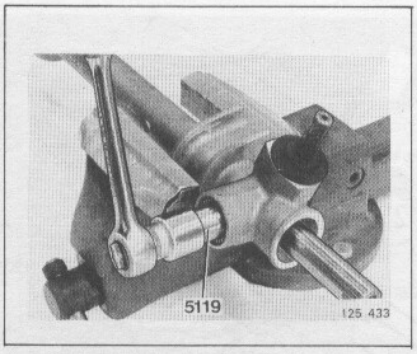
5054 Cover
adjusting balance



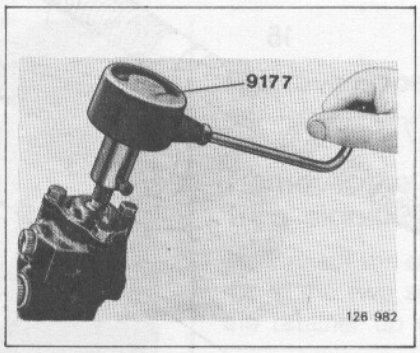
5055 Pressure gauge
balance and oil pressure
5175 5176 Nipples
checking balance



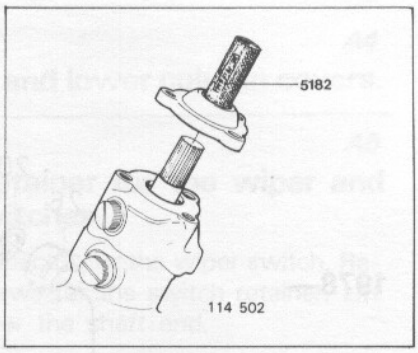
5056 Sleeve
installing seal



5119 Wrench
lock nut, pinion upper
bearing, ZF



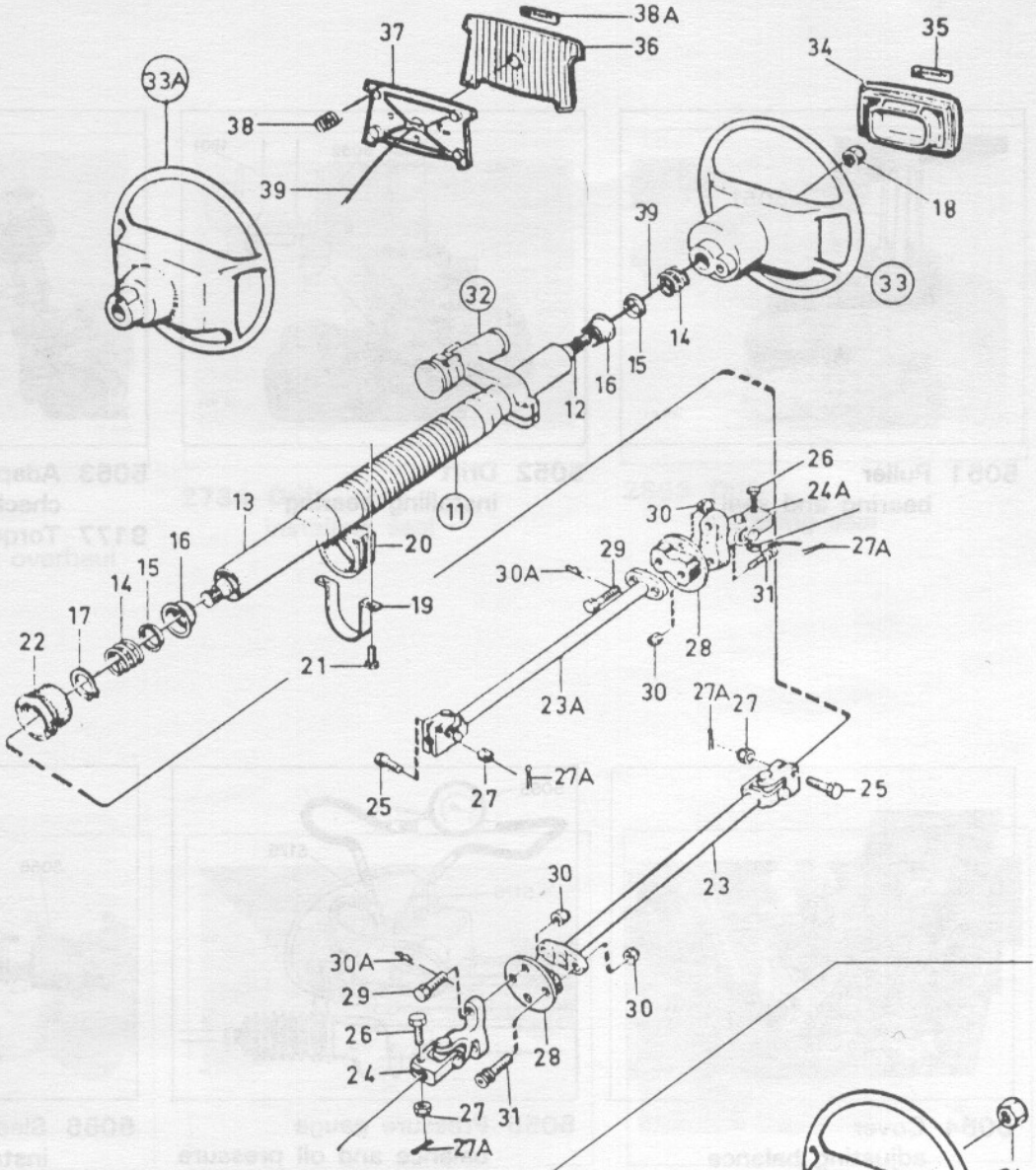
5179 Adapter
checking balance



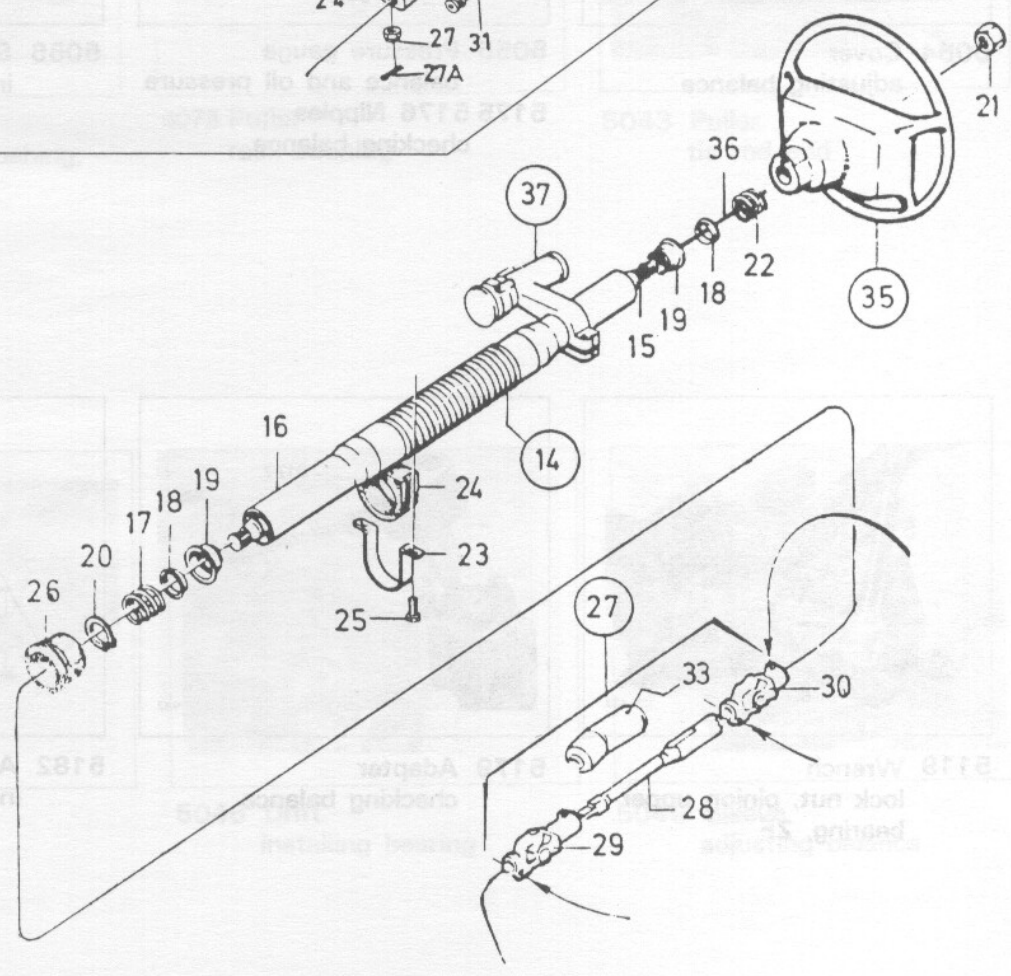
5182 Adapter
installing cover

Steering column, steering lock

1976—1977



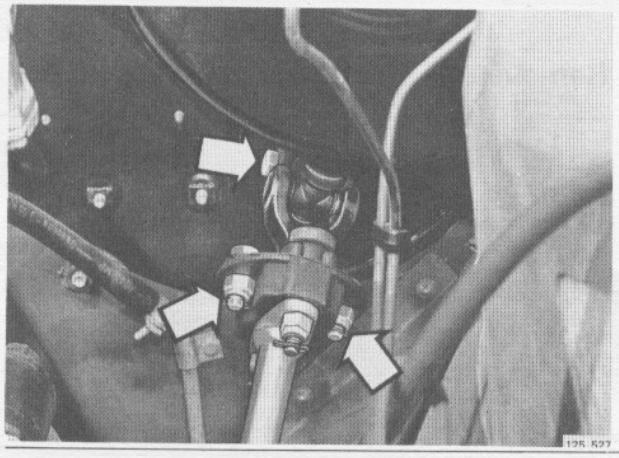
1978—



Replacing steering column or steering lock

Special tools:

2263 Steering wheel puller (1976–1978)
Deep thin wall socket (1979–)



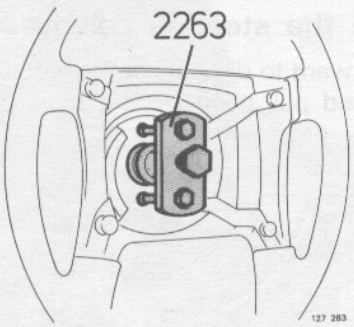
A1

Disconnect the battery ground cable.

A2

Disconnect the upper joint from the upper and lower steering shafts.

Use a screwdriver to open the flange joint so it comes loose from the upper steering shaft.



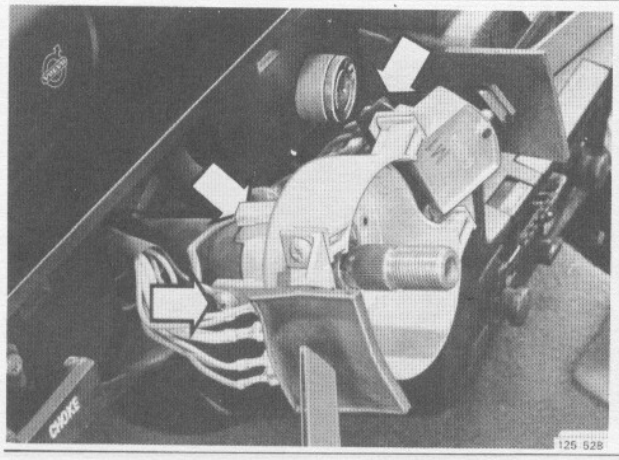
A3

Remove the steering wheel.

Use a screwdriver to pry loose the steering wheel pad.

Use steering wheel puller 2263 to remove the steering wheel. Do not knock on the steering wheel or puller as this may deform the crumple-zone unit in the upper section of the steering shaft.

Note: from 1979 year Model no puller is needed. Use a deep thin wall socket to remove the steering wheel nut and pull the steering wheel UP.



A4

Remove upper and lower column covers.

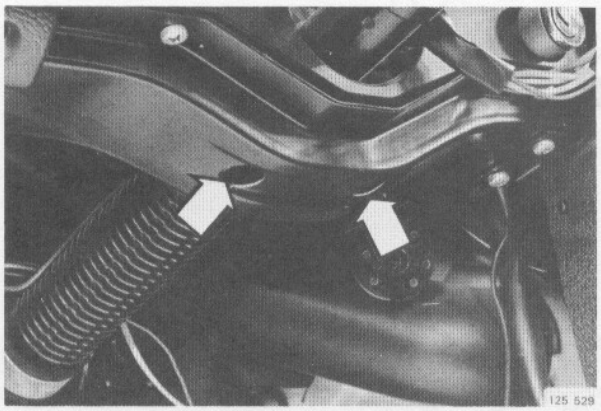
A5

Remove the retainer for the wiper and turn signal switches.

Disconnect the connector for the wiper switch. Remove the two screws for the switch retainer. Lift the retainer up over the shaft end.

A6

Remove the panel under the instrument panel. Remove the side panel at the center console.



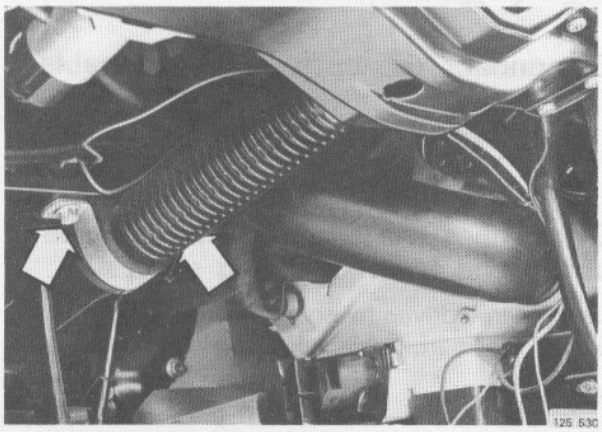
A7

Disconnect the connector at the steering lock.

A8

Remove the steering lock retaining screws.

Drill holes in the screw centers. Use fitting screw extractor to remove the screws.

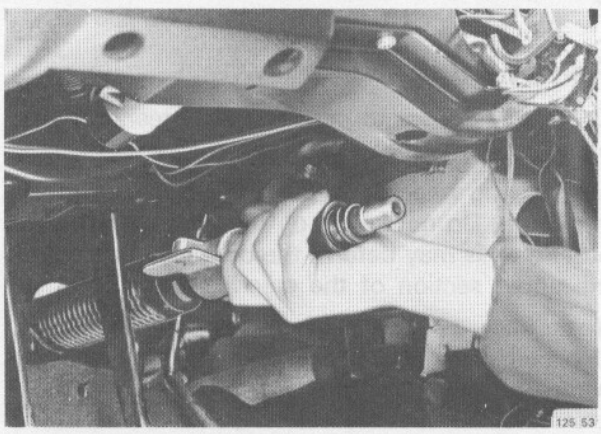


A9

Remove the defroster hose.

A10

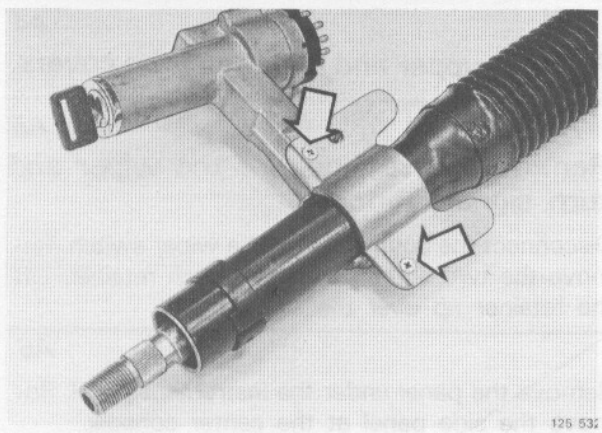
Remove the lower retainer bracket for the steering column.



A11

Remove the steering column.

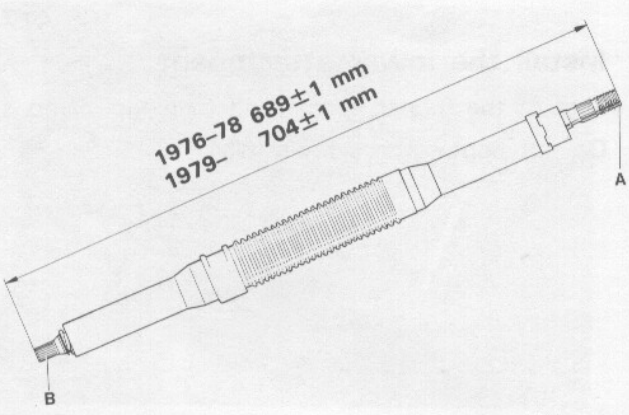
Push it forward to disconnect the rubber seal. Then lower it and pull it out.



A12

Remove the steering lock.

Use the key to unlock the lock. Remove the retaining screws.



113 230

A13

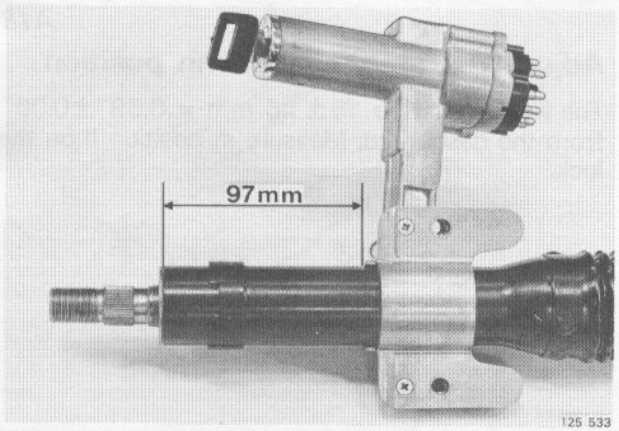
Check the steering column.

Check that the upper crumple zone is intact. Its upper end (A) should not move axially in relation to the lower end (B).

The overall length of the steering column should be:

Models:
1976–1978 689±1 mm = 27.126"±0.04"

1979– 704±1 mm = 27.717"=0.04"

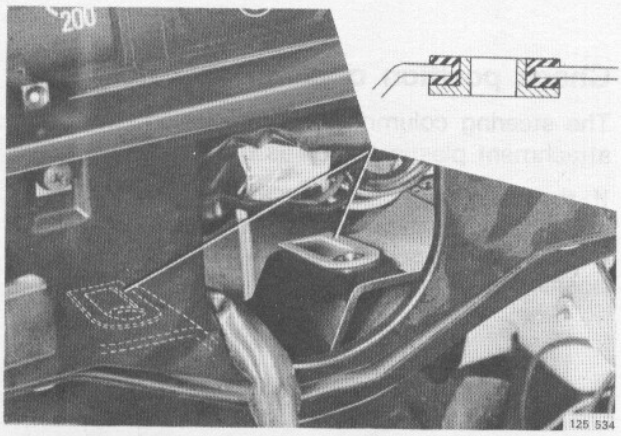


125 533

A14

Install the steering lock.

Position the lock so that the distance between the lock upper part and the end of the tube is 97 mm = 3.82".

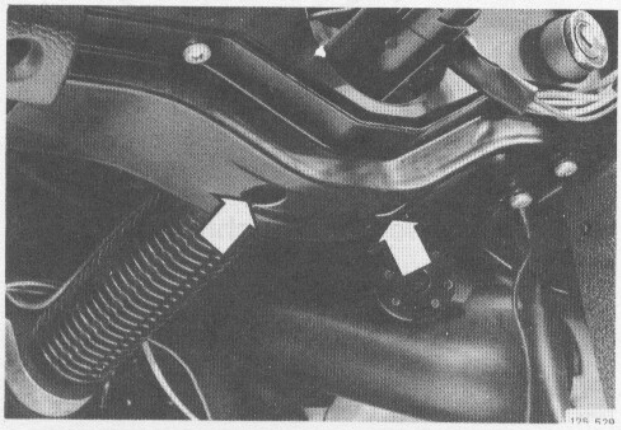


125 534

A15

Check the two plastic guides.

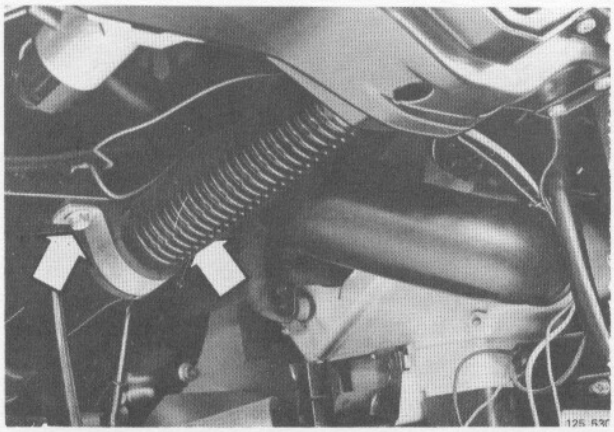
They must be provided with spacers and turned so that the washers are DOWN.



A16

Position the steering column.

Screw in the shearing bolts but do not tighten.

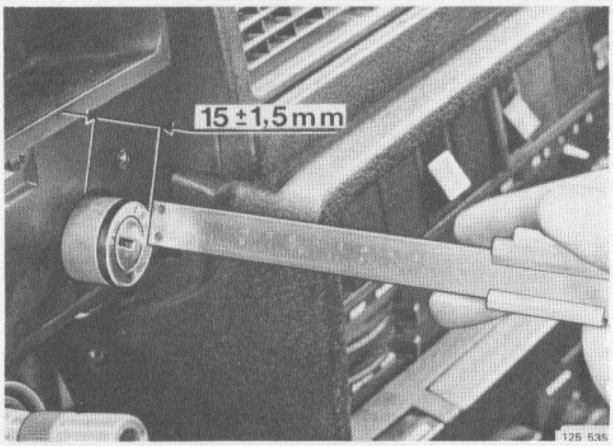


A17

Install the lower attachment.

First fit the rubber spacer and then the clamp.

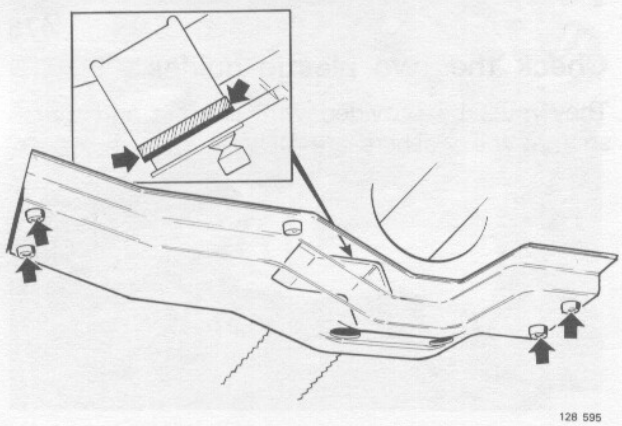
Do not tighten the screws fully.



A18

Adjust the steering column position.

The lock should be 15±1.5 mm = 0.59"±0.06" from the dashboard. Measure at position II on the lock.

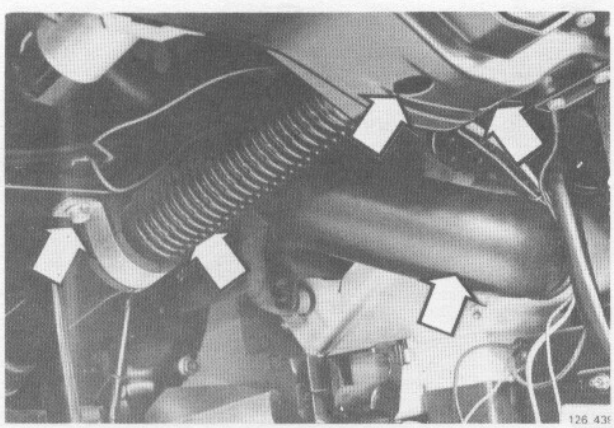


A19

Check position of steering column.

The steering column must not contact the upper attachment plastic guides as this can cause noise.

If the steering column is incorrectly positioned, adjust the dashboard beam location. Release the beam retaining screws, adjust the beam to correct position and tighten the retaining screws again.



A20

Tighten the upper attachment.

DO NOT shear the shearing bolts at this moment.

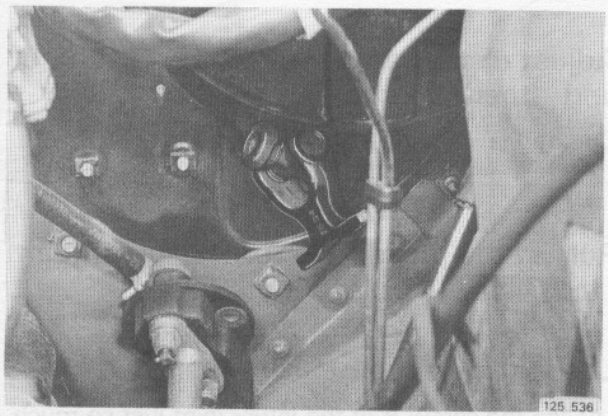
A21

Tighten the lower attachment.

Torque 20±5 Nm = 14±4 ft.lbs.

A22

Position the defroster hose.



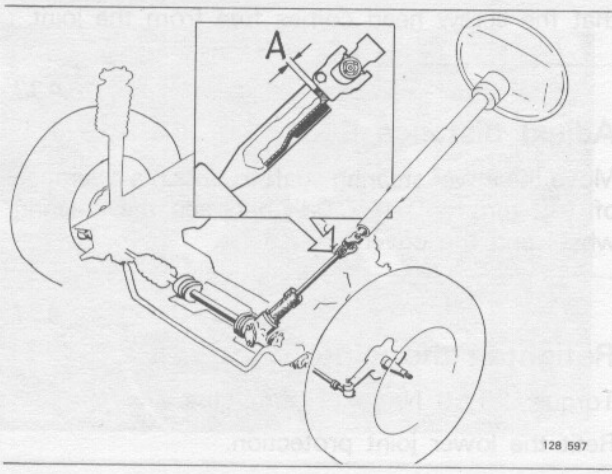
A23

Position the rubber seal on the dashboard. Loosely fit the upper joint on the upper steering shaft.

A24

Attach the lower steering shaft flange to the upper joint.

Torque: 23±5 Nm = 17±4 ft.lbs.



A25

For 1979 and later Models
and for 1978 Models equipped with ZF power steering gear:

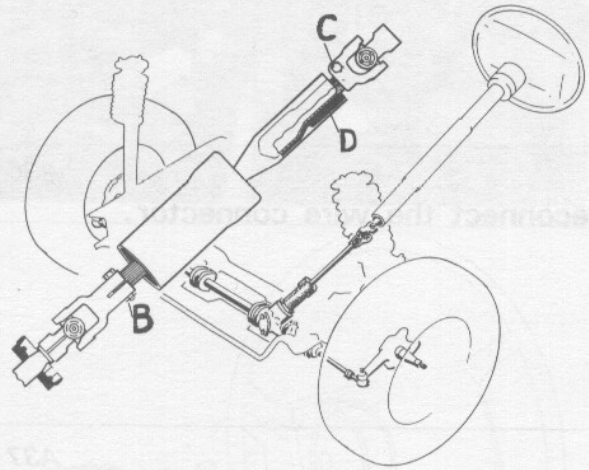
Check steering shaft.

Following any repair to the steering shaft.

The distance A between the upper joint and the shoulder on the lower steering shaft should be:

when checking 10–19 mm = 0.40–0.75"
15 mm = 0.60"

If incorrect, the distance should be adjusted as follows:



A26

Pull up the protection for the lower joint.

(Not power steering equipped.)

A27

Loosen the joints.

Loosen the screws B at the lower joint and C at the upper joint just so much that the screw head comes free from the joint.

A28

Adjust the distance A.

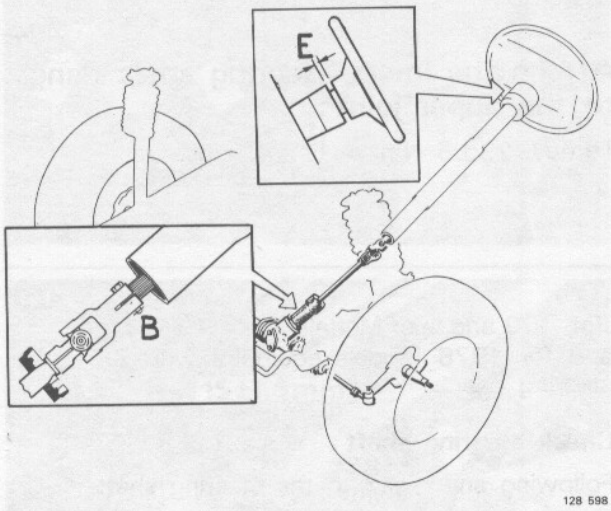
Move lower shaft up or down. Be careful not to change the position of the upper steering shaft as it will influence the distance between the steering wheel and the covers.

A29

Retighten the joints.

Torque: 23±5 Nm = 17±4 ft.lbs.

Refit the lower joint protection (not vehicles with power steering).



A30

Adjust distance between steering wheel and steering wheel cover.

Operations A25–A29 must be completed.

A31

Pull up the protection for the lower joint.

A32

Loosen lower joint.

Loosen the screw B at the lower joint just so much that the screw head comes free from the joint.

A33

Adjust distance E.

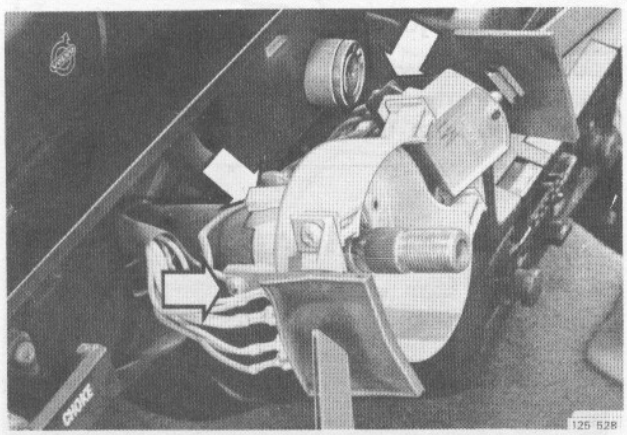
Move the lower steering shaft to obtain a clearance of 1–2 mm = 0.04–0.08" between the steering wheel and the covers.

A34

Retighten the joint.

Torque: 23±5 Nm = 17±4 ft.lbs.

Refit the lower joint protection.



A35

Attach the switch retainer. Reconnect the wires.

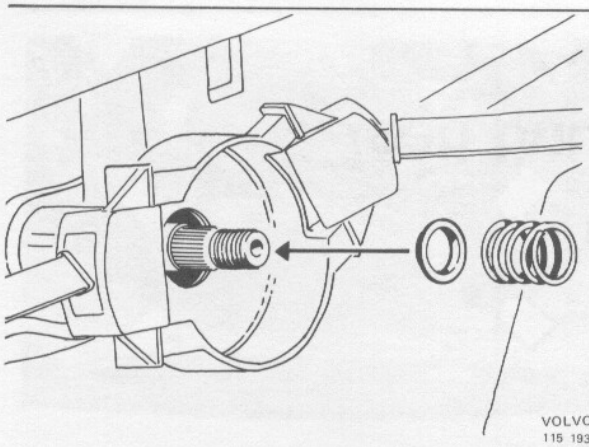
Use one of the retaining screws to attach the ground wire.

A36

Reconnect the wire connector.

A37

Install upper and lower steering column covers.

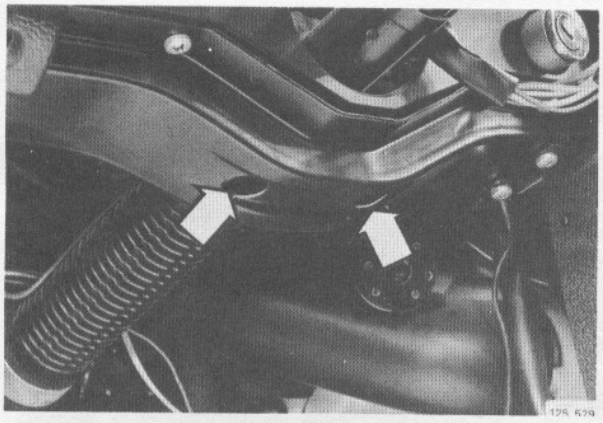


A38

Position spring seat and spring. Install the steering wheel.

Observe correct steering wheel spoke position.

Torque 60 ± 15 Nm = 44 ± 11 ft. lbs.

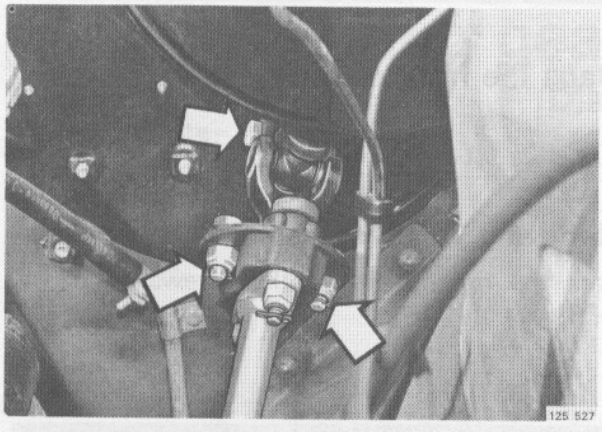


A39

Shear the shearing bolts.

A40

Install side panel and panel under the instrument panel



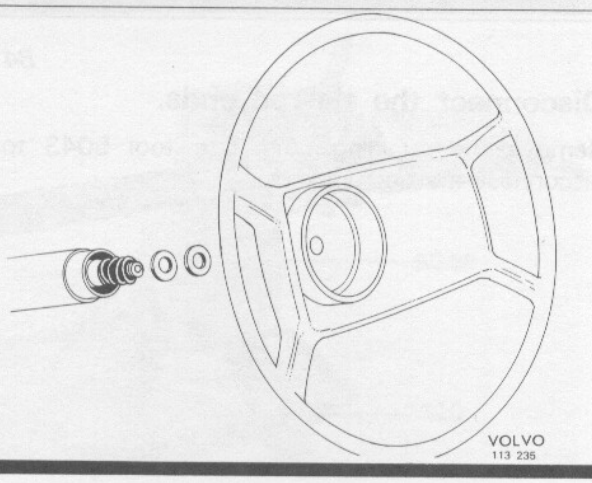
A41

Tighten the screw for the upper joint flange.

Torque: 25±5 Nm = 18±4 ft.lbs.

A42

Reconnect the battery ground cable. Test operation.



A43

Remedy in case of rattle at the steering shaft bearings.

The bearing pre-tension should be increased by installing one (in severe cases two) washer on top of the spring.

Use steering wheel puller 2263 for 1976–1978 Models.

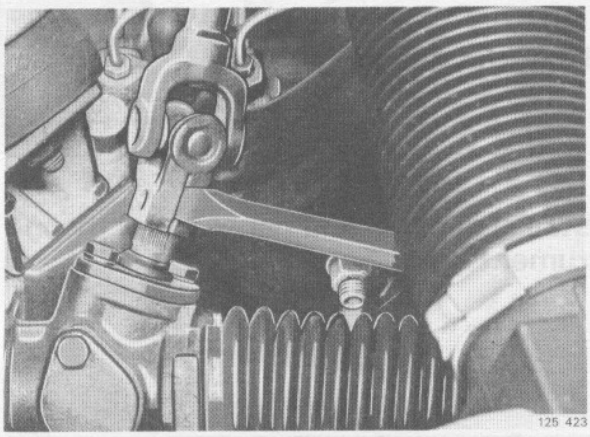
For 1979 Models and on a deep thin wall socket is used to remove the steering wheel nut. The steering wheel can be removed without steering wheel puller.

Manual steering gear

Removal

Special tool:

5043 Tie rod end puller

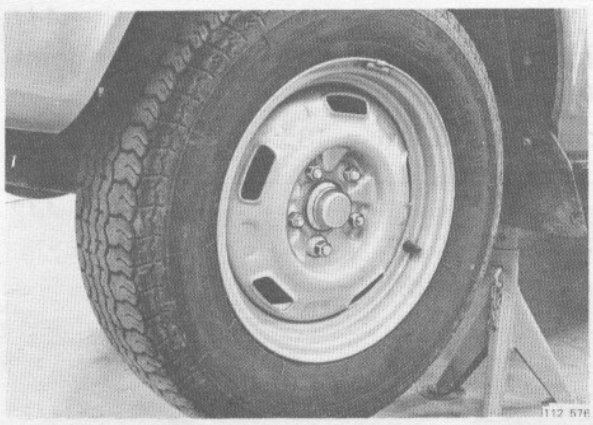


B1

Disconnect the steering shaft flange at the steering gear.

Remove the clamp screw. Use a screwdriver to open the flange.

Late versions have a plastic protection cover for the joint. Push it up to gain access to the lower joint.



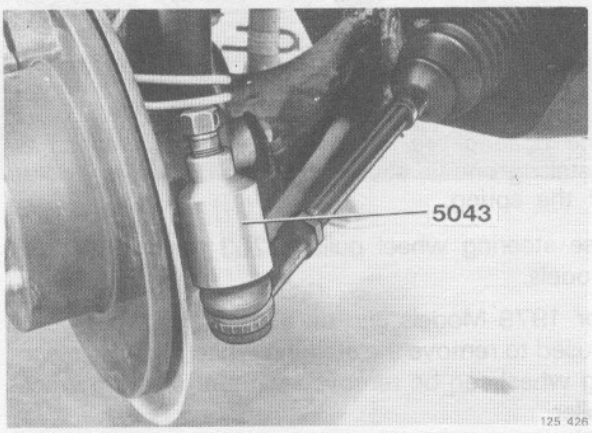
B2

Place the front end on stands.

B3

Mark and remove the front wheels.

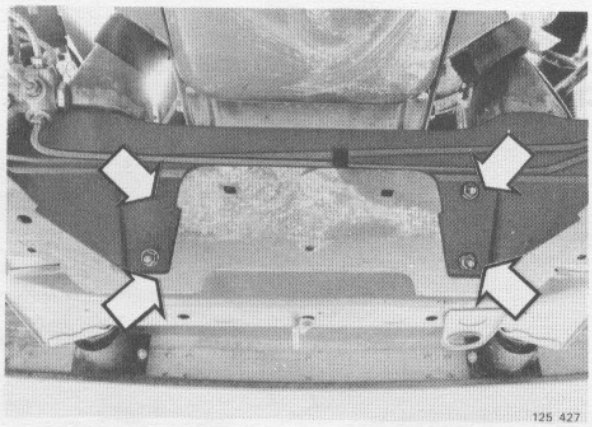
Mark the rim relative to the screws to avoid re-balancing.



B4

Disconnect the tie rod ends.

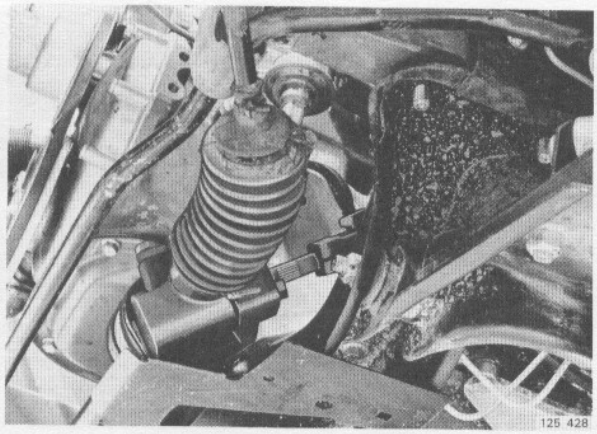
Remove the retaining nuts. Use tool 5043 to disconnect the tie rod ends.



B5

Disconnect the steering gear at the front axle beam.

First remove the splash shield under the engine. Save rubber spacers and plates.



B6

Disconnect the steering gear at the steering shaft flange. Remove the steering gear.

Save the dowel pins.

Steering gear type Cam Gear

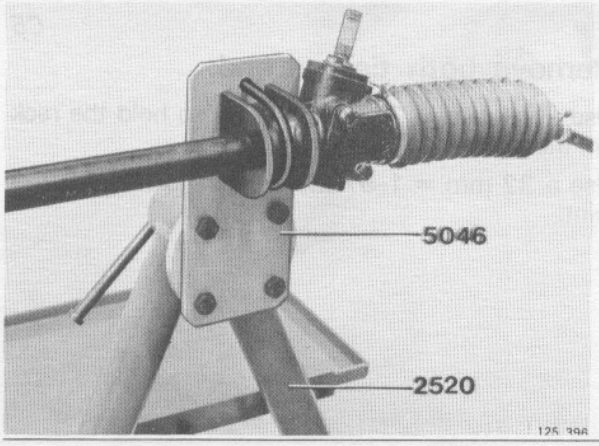
Disassembly

Special tools:
2520 Work stand
2734 Drift
4078 Puller
5046 Fixture
5047 Drift

Cleanliness

CAUTION

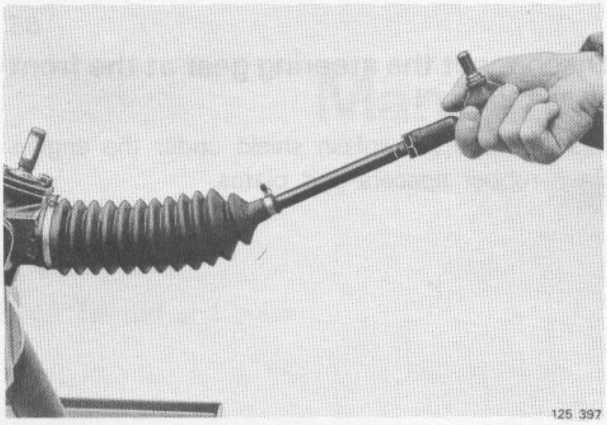
Do not allow dirt or foreign matter to come in contact with power steering components. Contamination will cause malfunction of the system or leaks causing unnecessary repairs.
Repairs to the power steeing system should be accomplished in a dirt and dust free area. Clean components thoroughly before disassembly.



C1

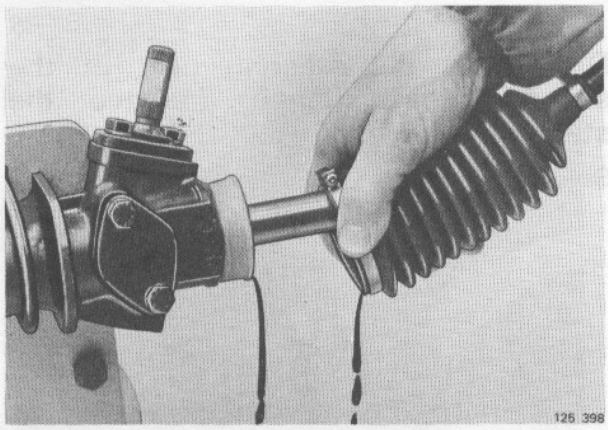
Install the steering gear on a stand.

Use stand 2520 and fixture 5046. Use the U-bolt from the vehicle.



C2

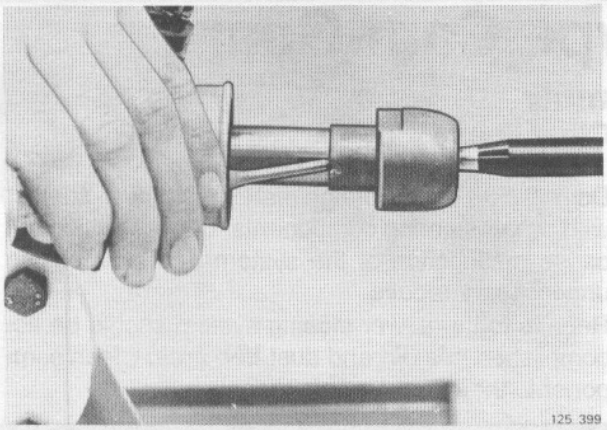
Clean the exterior of the steering gear. Check inner and outer joints for wear.



C3

Disconnect the rubber bellows at the steering gear housing.

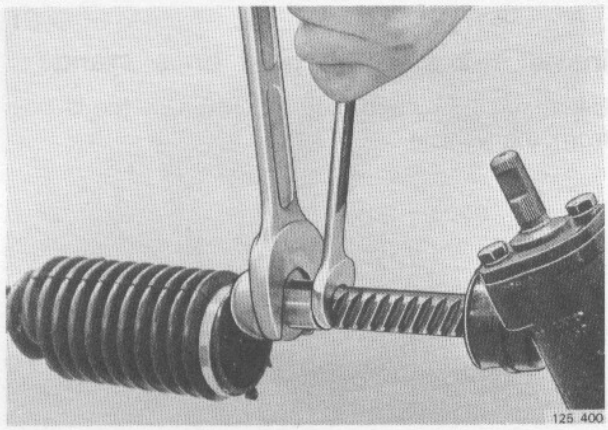
Early type steering gears: collect the oil in a pan.



C4

Bend up locked portion of ball joints.

Use a narrow chisel.

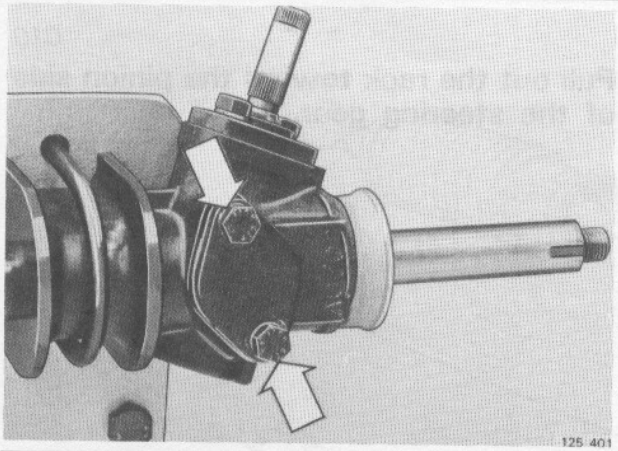


C5

Remove both tie rod ends.

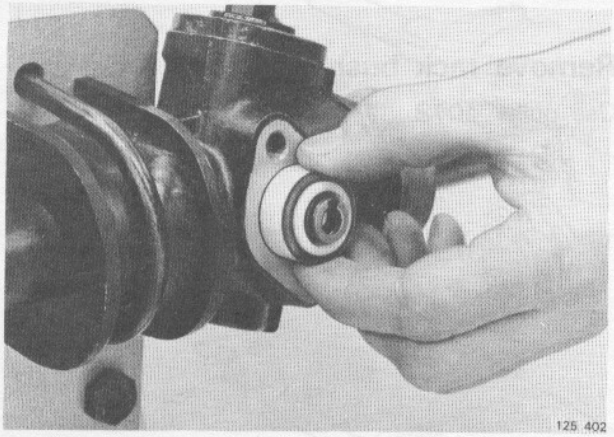
Use a 18 mm = 23/32" wrench to hold the rack on the outermost tooth.

Use a 32 mm = 1-9/32" wrench to turn the ball joint.



C6

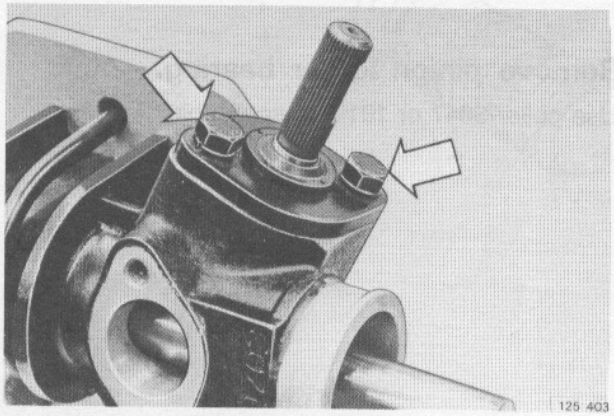
Remove the cover for the pre-tensioning device.



C7

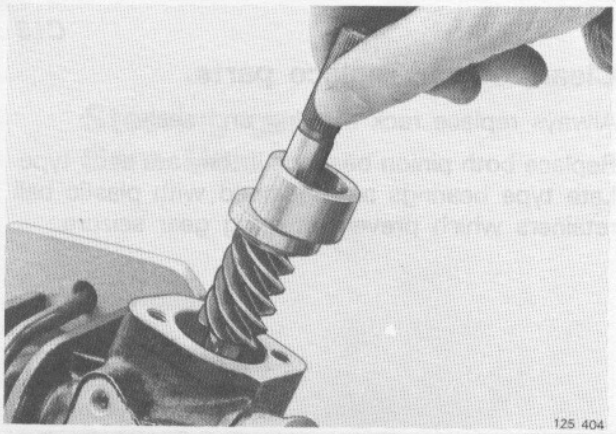
Remove spring, piston and O-ring.

No O-ring on steering gear lubricated with grease.



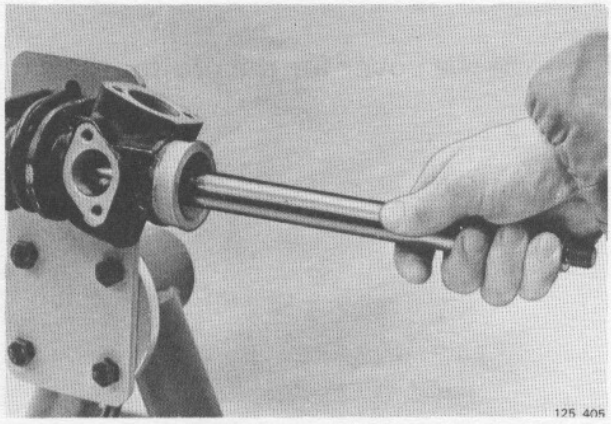
C8

Remove pinion cover.



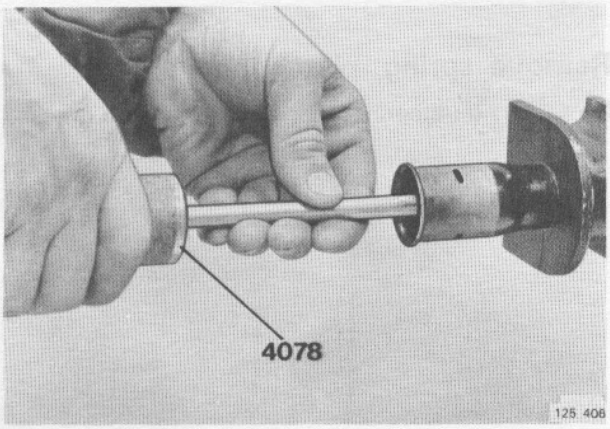
C9

Remove pinion and spacer sleeve.



C10

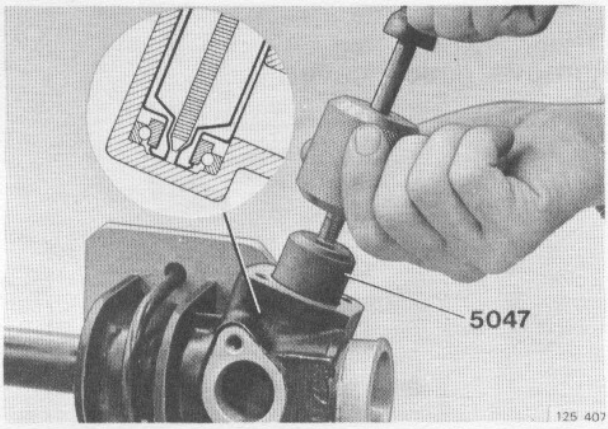
Pull out the rack toward the pinion side of the steering gear.



C11

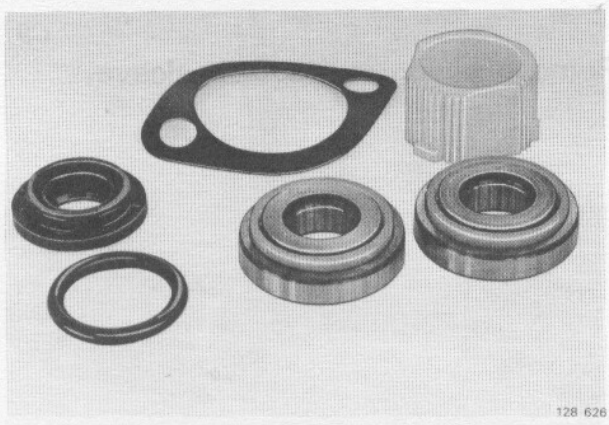
Remove rack bushing.

Use puller 4078.



Remove pinion lower bearing.

Use puller 5047 or 1819 as applicable.

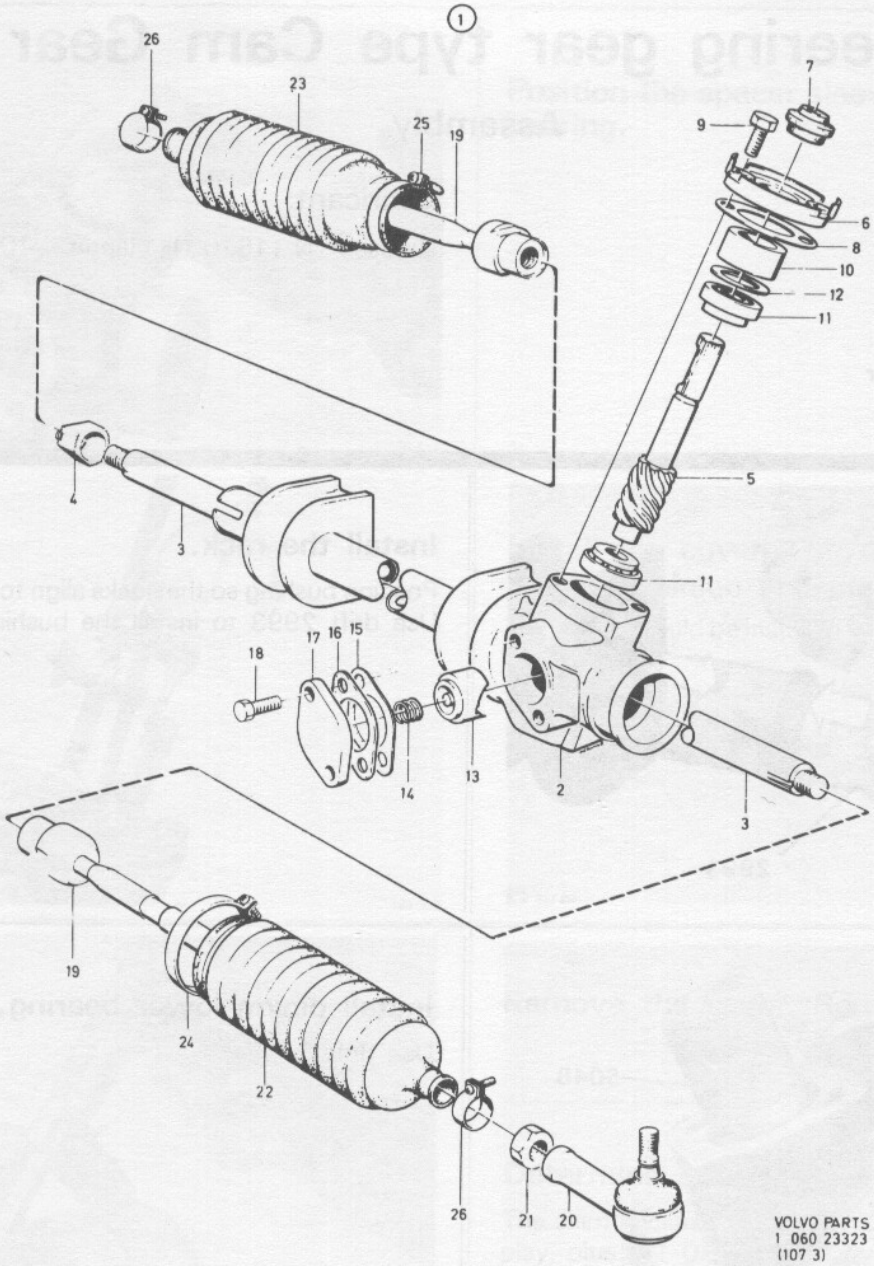


C13

Clean, check, replace parts.

Always replace rack bushing and seals.

Replace both pinion bearings if they are early type. Late type bearings are equipped with plastic ball retainers which prevent steering gear seizure.



Steering gear
Cam Gear

Steering gear type Cam Gear

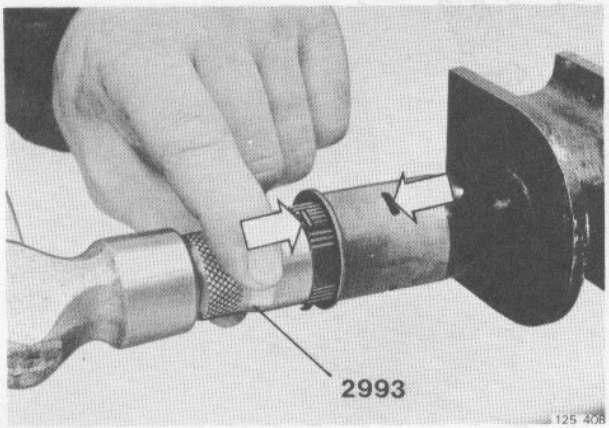
Assembly

Special tools:

2734 Drift
2993 Drift
5048 Drift
5053 Adapter
9177 Torque meter

Lubricant:

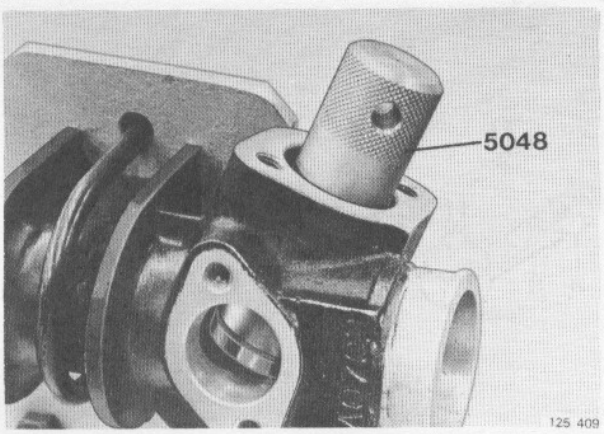
Grease P/N 1161001-1 (approx. 100 grams = 3.5 oz.)



D1

Install the rack.

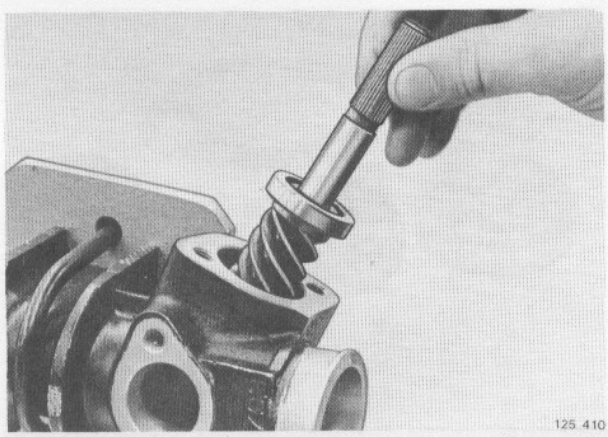
Position bushing so that locks align to housing slots. Use drift 2993 to install the bushing.



D2

Install pinion lower bearing.

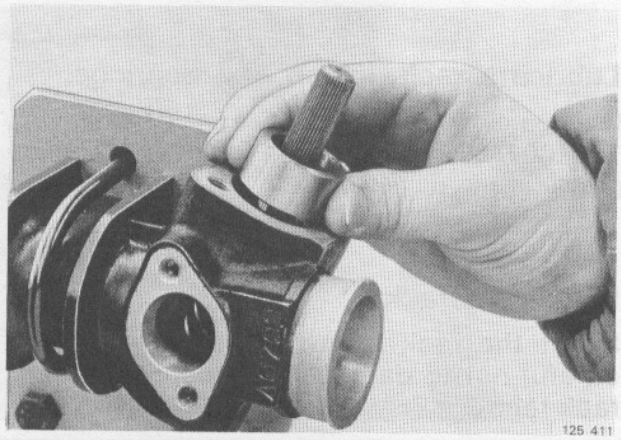
Use drift 5048.



D3

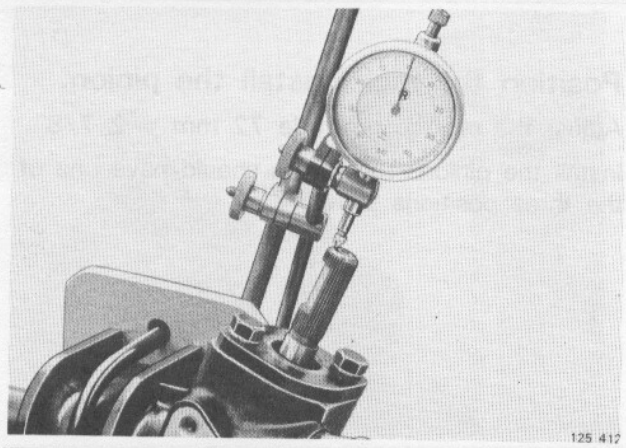
Position pinion and upper bearing assembly in the housing.

Note: no shims on the upper bearing.



D4

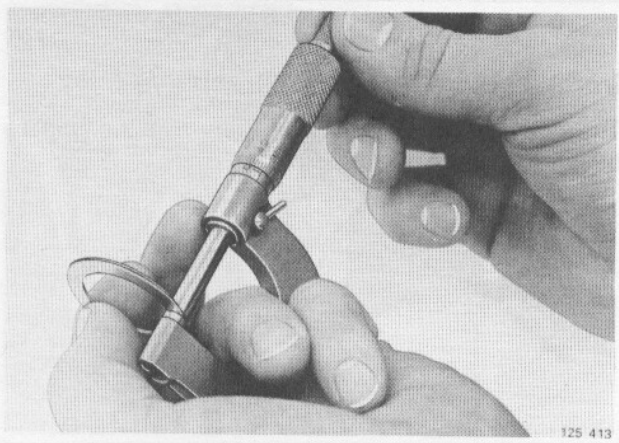
Position the spacer sleeve on top of the bearing.



D5

Install the cover. Use dial gauge to measure pinion end play.

The cover should be installed **with** gasket and **without** seal.



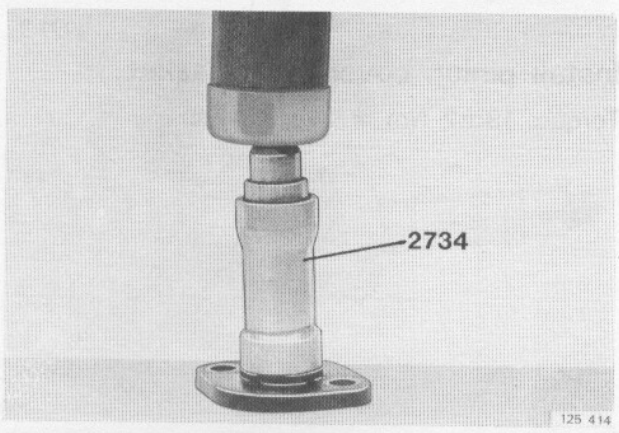
D6

Remove the cover. Remove the pinion.

D7

Determine amount of shims.

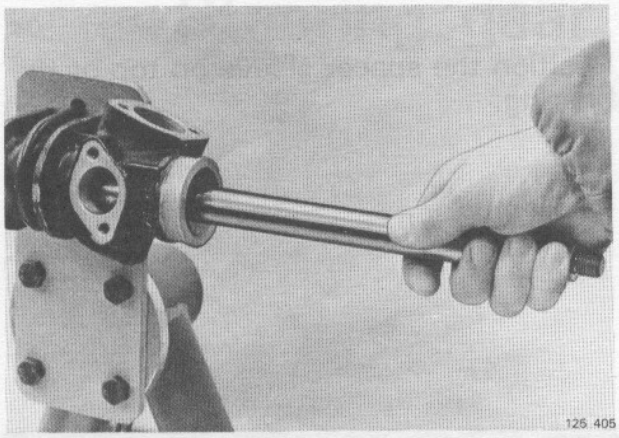
The shim thickness should equal the measured end play, plus 0.1–0.0025 mm for pre-tensioning.



D8

Install pinion cover seal.

Use drift 2734.



D9

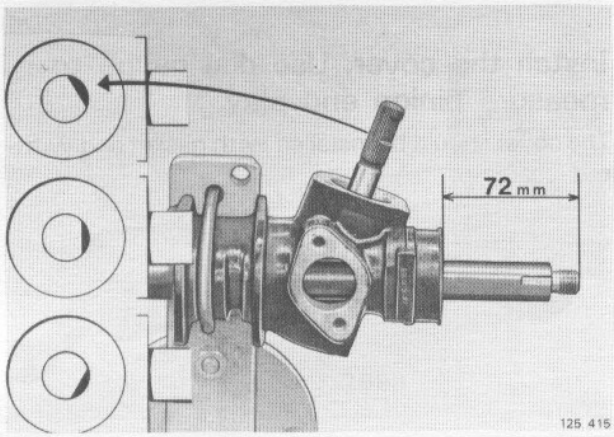
Lubricate rack, pinion and bearings.

Use approx. 75 grams = 2.5 ozs. of Volvo P/N 1161001. Lubricate the parts carefully. Fill excess grease in the rubber bellow.

D10

Install the rack.

Insert the rack from the pinion side. Be careful not to damage the bushing by the rack teeth.

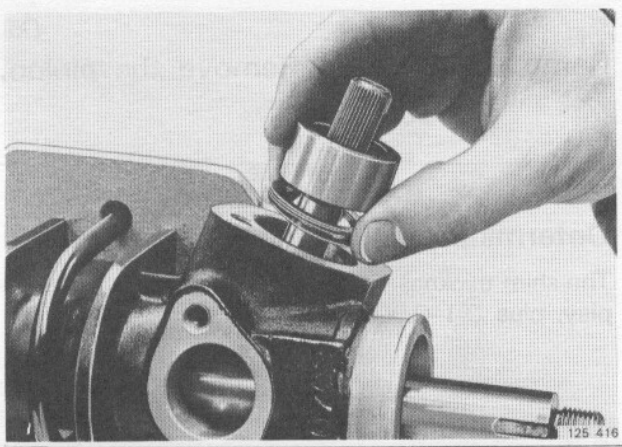


D11

Position the rack. Install the pinion.

Adjust the rack to protrude 72 mm = 2-7/8".

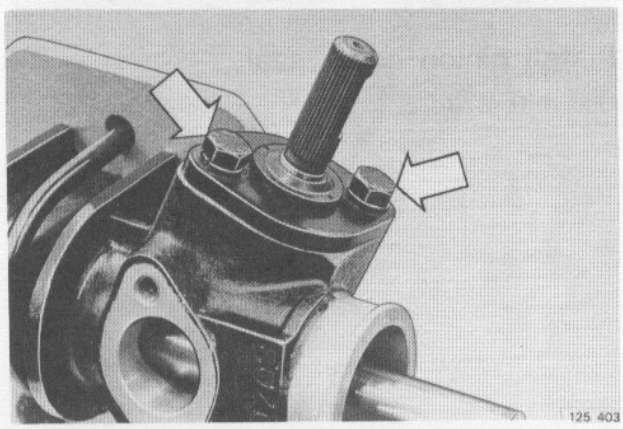
Install the pinion. The pinion should have one of the three positions shown.



D12

Install shims and spacer sleeve.

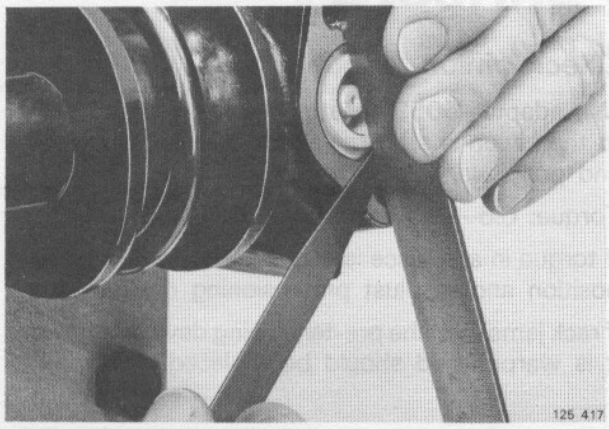
The shims should be located between the upper bearing and the spacer sleeve.



D13

Install pinion cover with gasket.

Torque: 19±2 Nm = 14±1.5 ft.lbs.

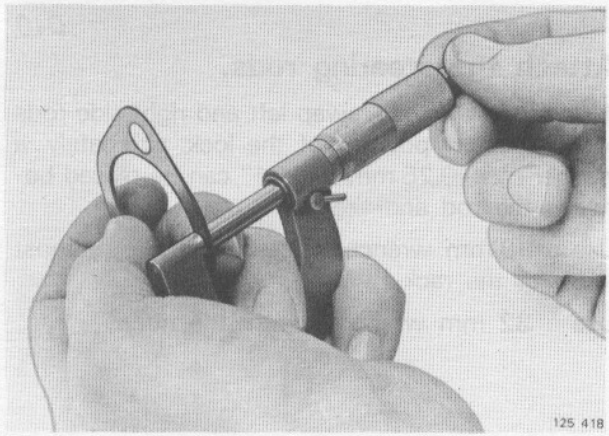


D14

Install the pre-tensioning piston in the housing and determine clearance.

The piston should be without O-ring and spring. Use feeler gauge and ruler to determine the clearance from the piston end to the housing surface.

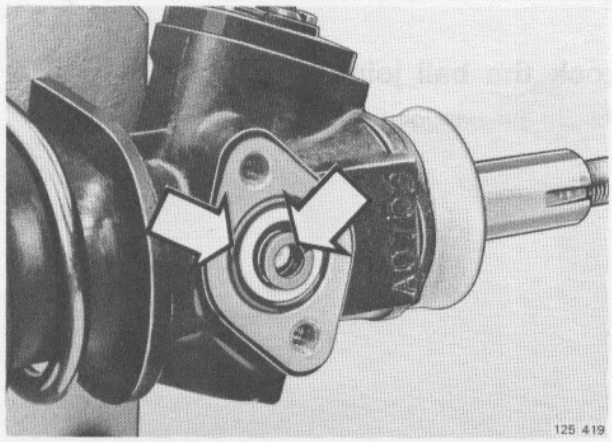
Move the rack from end to end and measure at the position where the largest clearance is obtained.



D15

Determine shims and gasket.

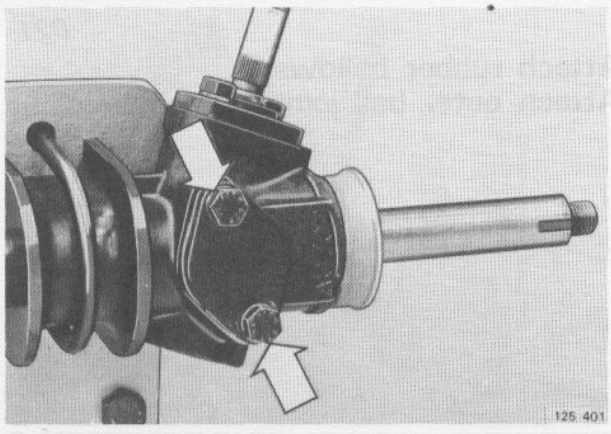
Shims and gasket should together equal determined clearance plus 0.05—0.15 mm = 0.002—0.006."



D16

Install spring and O-ring in the piston.

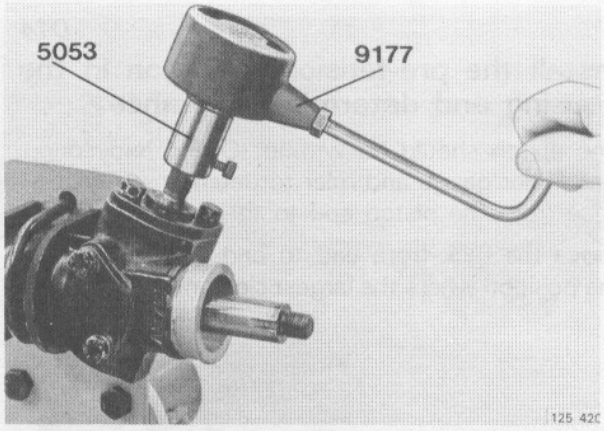
No O-ring on steering gear lubricated with grease.



D17

Install cover with shims and gasket.

Torque: 19±2 Nm = 14–1.5 ft.lbs.



D18

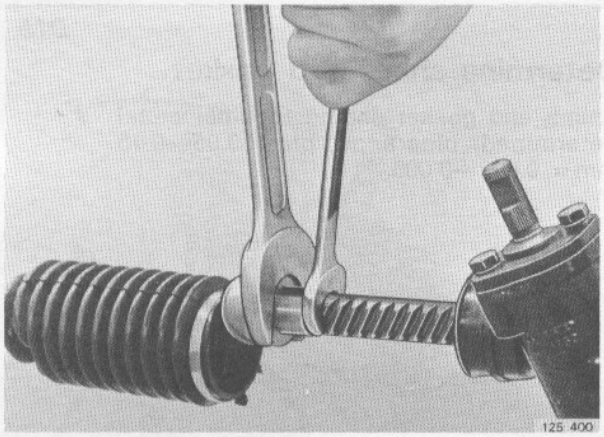
Check pinion torque.

Use adapter 5053 to attach torque meter 9117 to the pinion shaft. Crank back and forth between end positions.

Torque: 0.6–1.7 Nm = 5–15 in.lb.

If torque in any place is excessive, stop rack in that position and readjust pretensioning device.

If rack jams with the pre-tensioning device removed, it is warped and should be replaced.



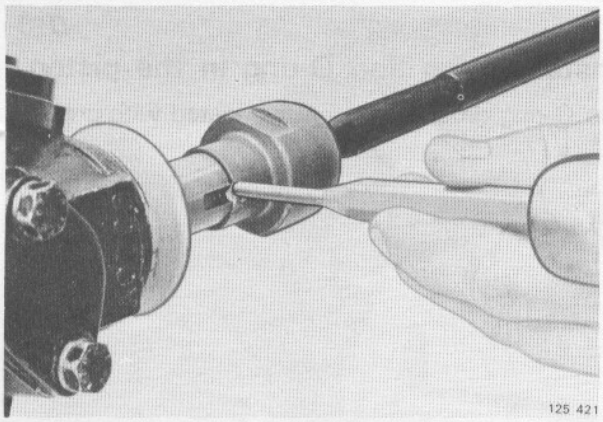
D19

Attach the steering rods.

If using the old rods, swap left and right side rods to obtain new position of the lock. alternately, a washer max. 0.25 mm = 0.01" can be placed between the rod and the rack.

Use a 18 mm wrench to hold on the outermost tooth of the rack.

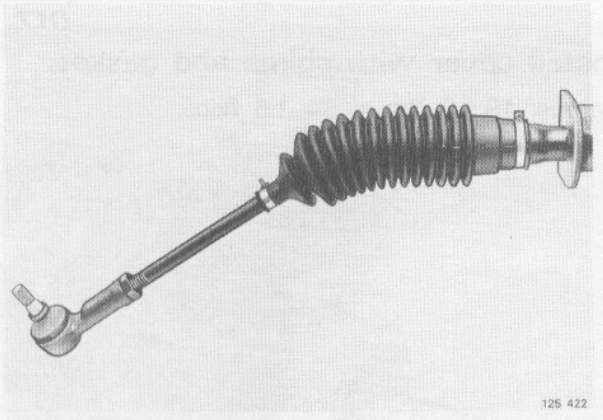
Use a 32 mm wrench to turn the nut.



D20

Lock the ball joint.

Punch the ball joint edge into the rack groove.



D21

Attach rubber bellows.
Attach outer ball joints (if removed).

Steering gear type ZF

Disassembly

Special tool:

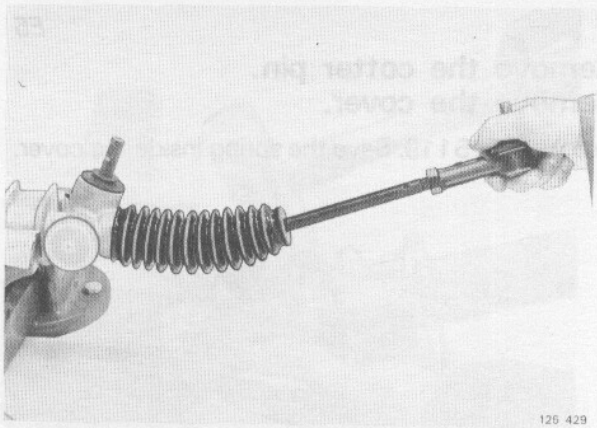
5119 Wrench

Cleanliness

CAUTION

Do not allow dirt or foreign matter to come in contact with power steering components. Contamination will cause malfunction of the system or leaks causing unnecessary repairs.

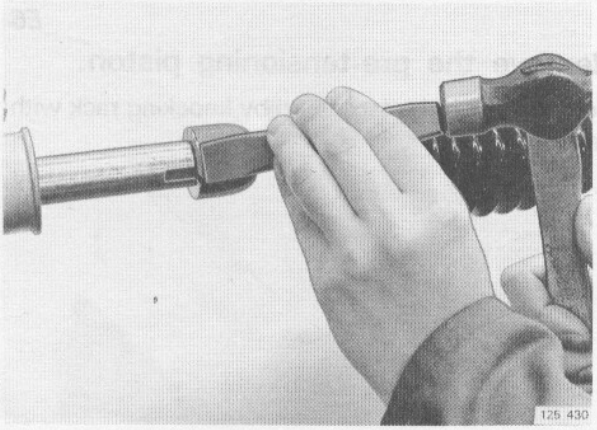
Repairs to the power steering system should be accomplished in a dirt and dust free area. Clean components thoroughly before disassembly.



E1

Clean the steering gear exterior. Install the steering gear in a vise. Check the ball joints.

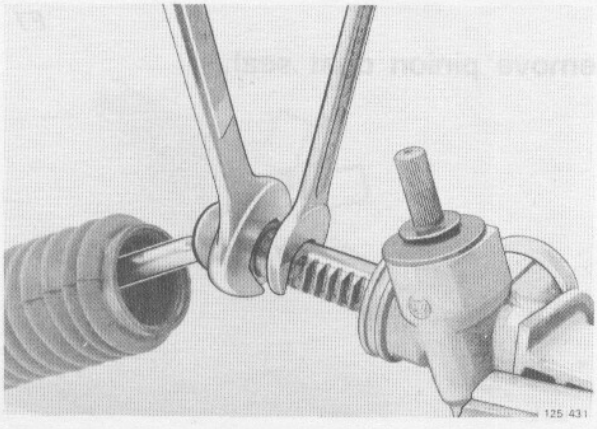
Use a vise with soft jaws.
Check inner and outer ball joints for wear.



E2

Remove the rubber bellows. Bend up the steering rod locks.

The rubber bellows are held in place by flanges. Use hands to pull them loose.

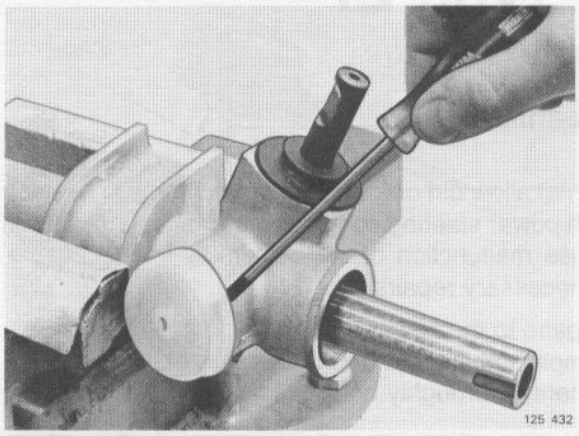


E3

Remove the steering rods.

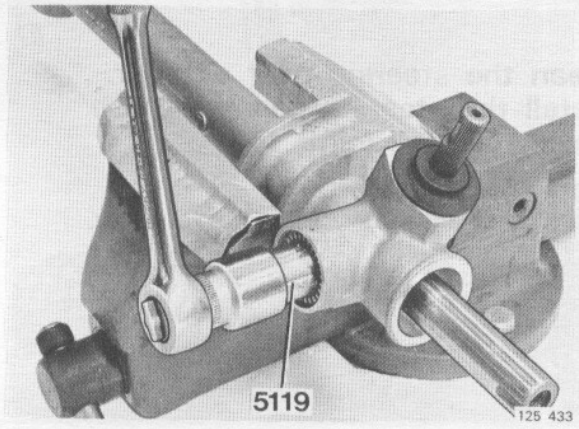
Use a 22 mm = 7/8" wrench to hold on the outermost tooth of the rack.

Use a 27 mm = 1–1/16" wrench to unscrew the joint.



E4

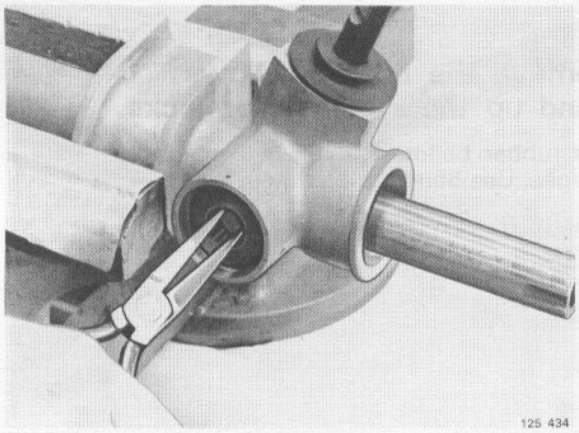
Remove the dust seal over the pre-tensioning device.



E5

Remove the cotter pin.
Remove the cover.

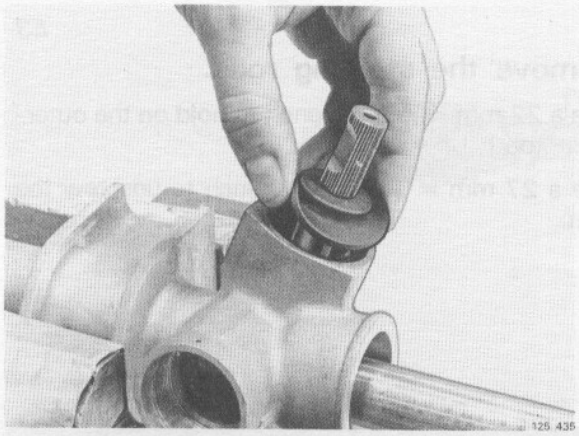
Use wrench 5119. Save the spring inside the cover.



E6

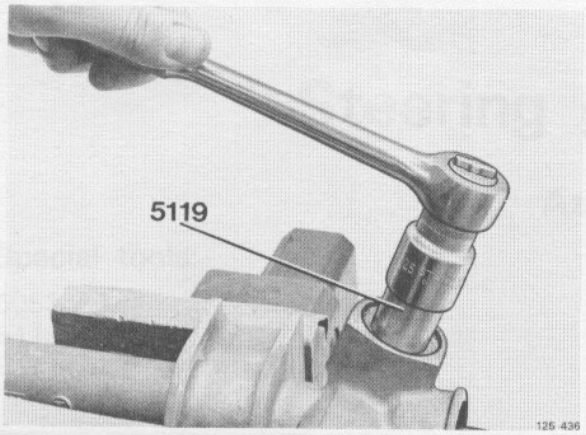
Remove the pre-tensioning piston.

Removal might be facilitated by knocking rack with palm.



E7

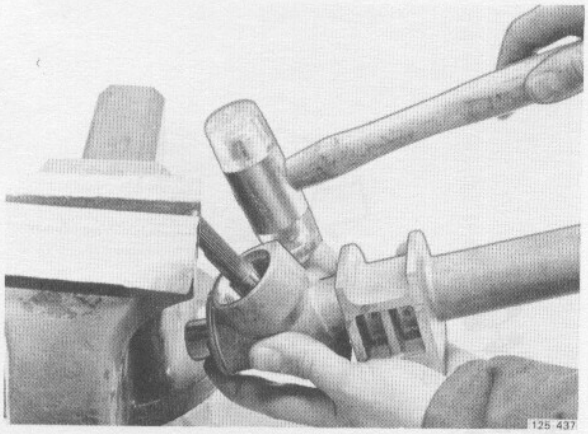
Remove pinion dust seal.



E8

Remove the pinion nut.

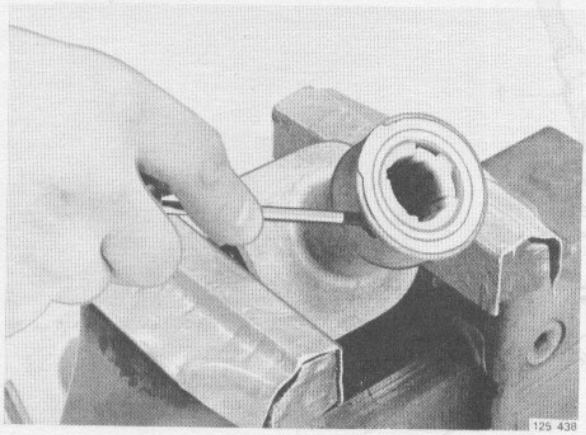
Use wrench 5119.
First remove any lock installed.



E9

Remove the pinion.

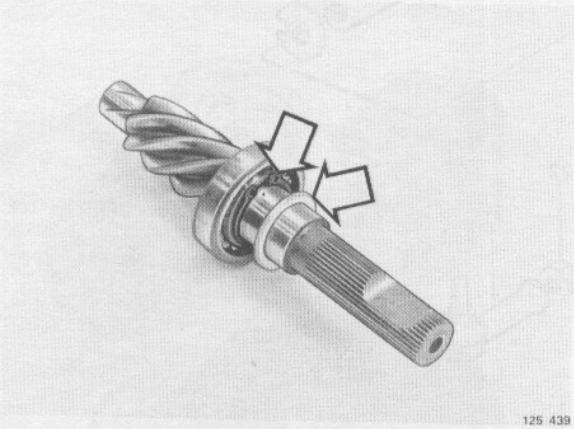
Clamp the pinion shaft in a vise with soft jaws. Tap lightly on the housing with a plastic-tip mallet.



E10

Remove the rack.
Remove the rack bushing.

Press in the locking tabs. Use a narrow screwdriver to pry out the bushing.



E11

To replace the pinion bearing:

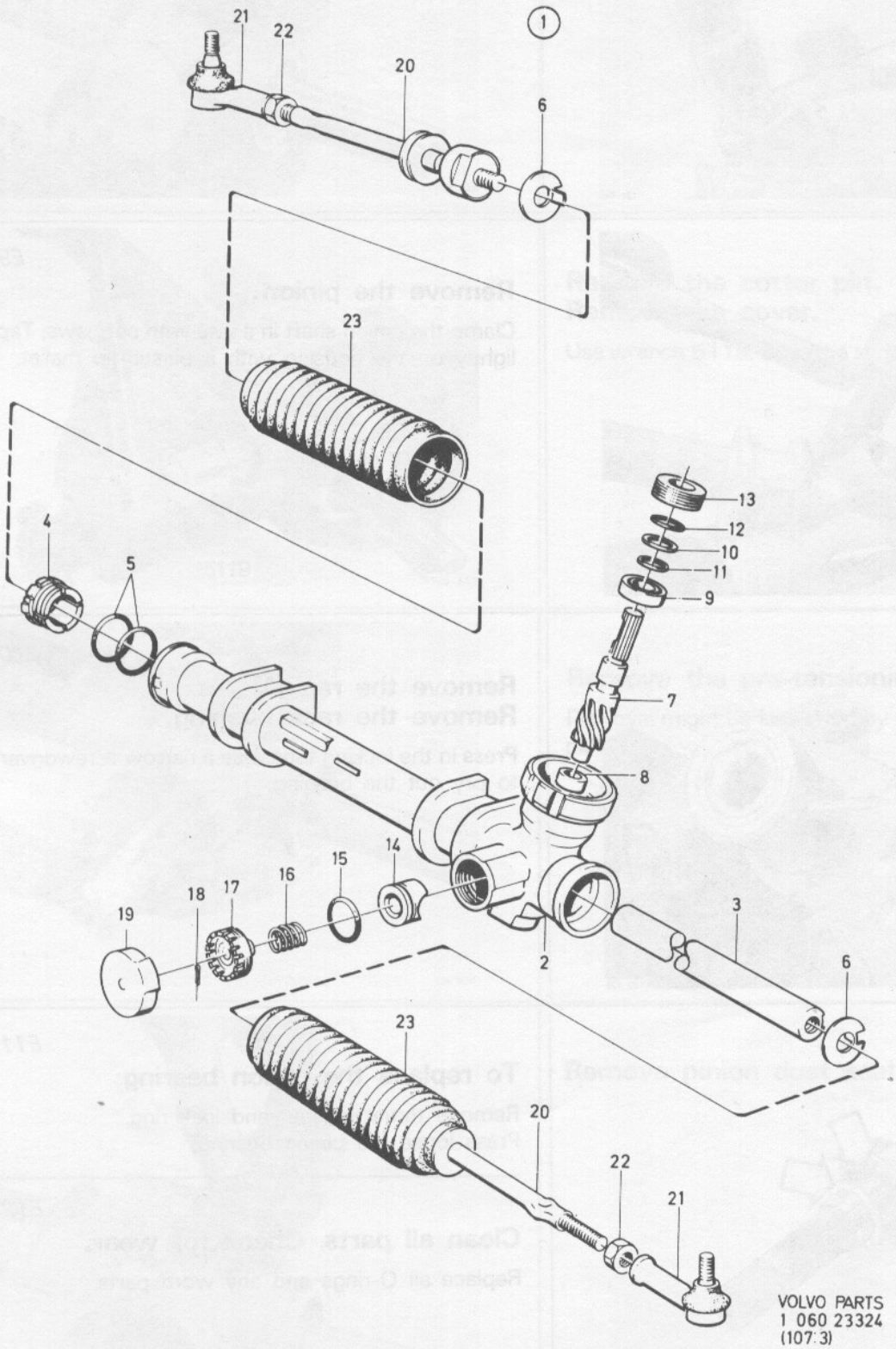
Remove thrust washer and lock ring.
Press loose the pinion bearing.

E12

Clean all parts. Check for wear.

Replace all O-rings and any worn parts.

Steering gear ZF



VOLVO PARTS
1 060 23324
(107:3)

Steering gear type ZF

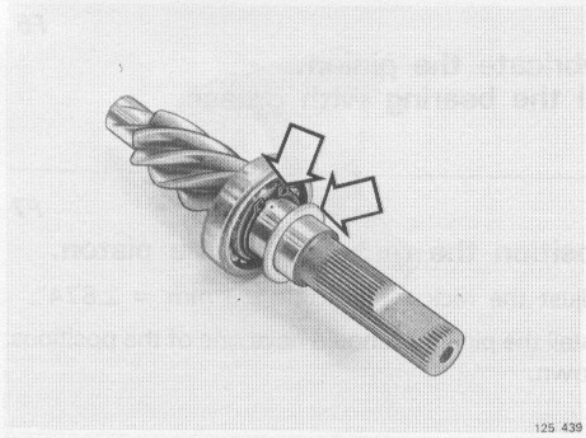
Assembly

Special tools:

5053 Adapter
5119 Wrench
9177 Torque meter

Lubricant:

Grease P/N 1161001-1

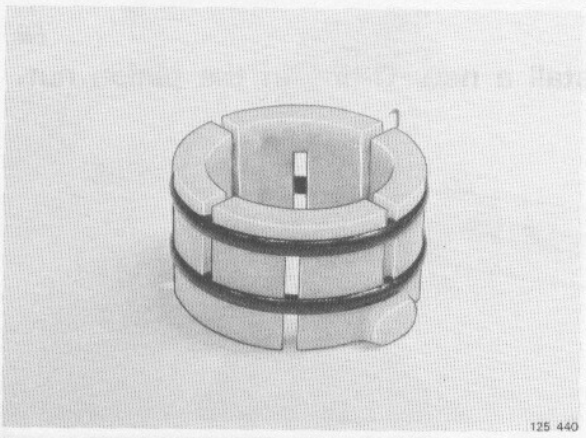


F1

Press the bearing onto the pinion.

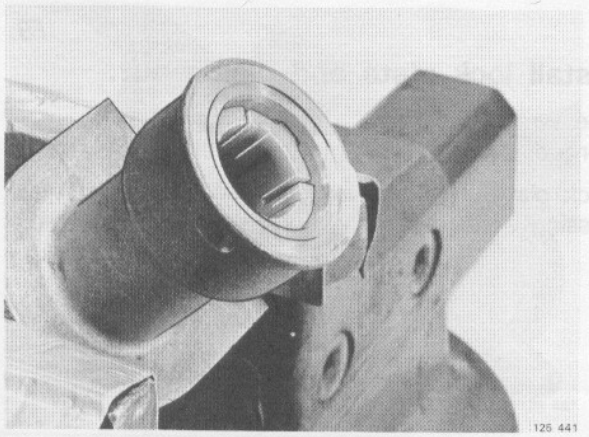
F2

Install lock ring and thrust washer.



F3

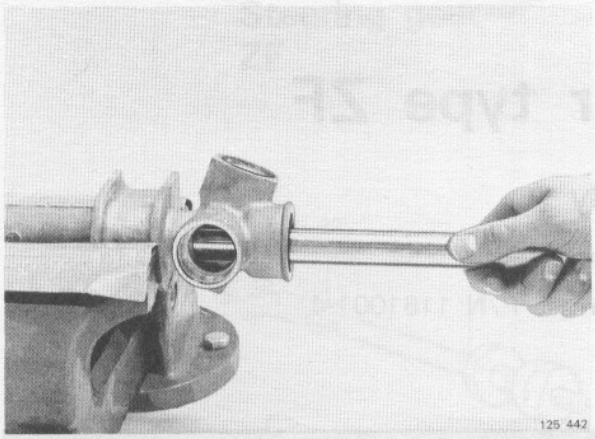
Install new O-rings on the rack bushing.



F4

Install the rack bushing.

Make sure the locking tabs of the bushing fit correctly in the housing recesses.

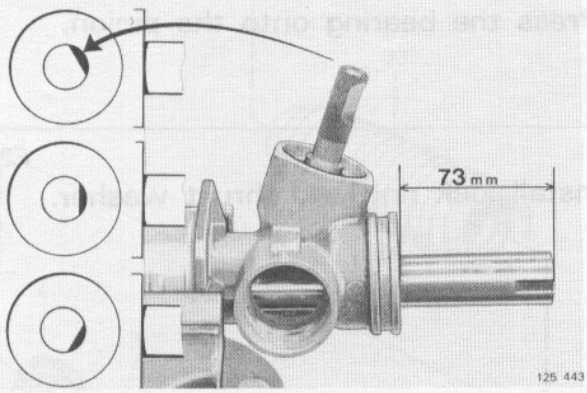


F5

Lubricate and install the rack.

Use grease P/N 1161001.

Insert rack in pinion side of housing. Be careful not to damage the bushing with the rack teeth.



F6

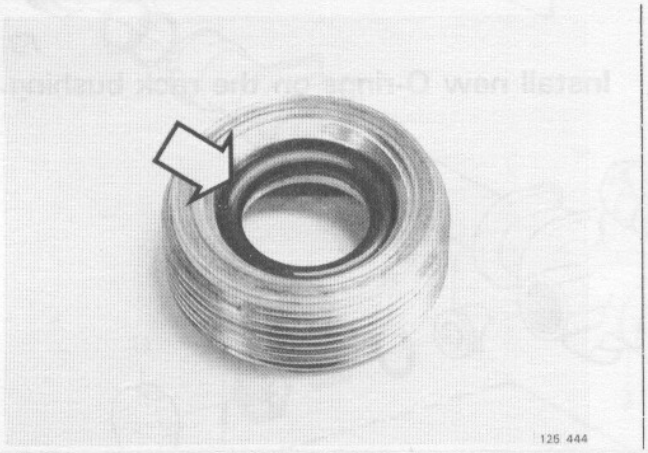
Lubricate the pinion.
Fill the bearing with grease.

F7

Position the rack. Install the piston.

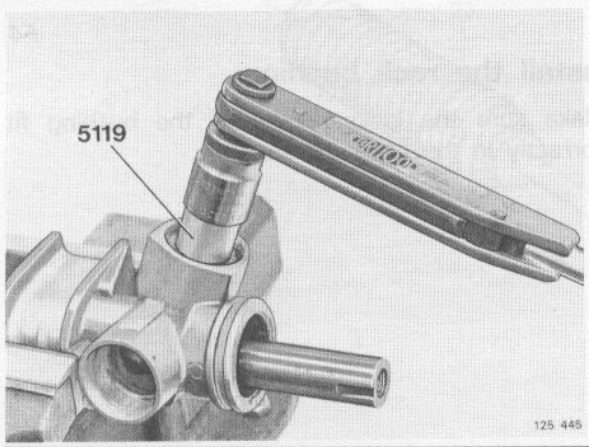
Adjust the rack to protrude 73 mm = 2.874".

Install the pinion. It should have one of the positions shown.



F8

Install a new O-ring in the pinion nut.

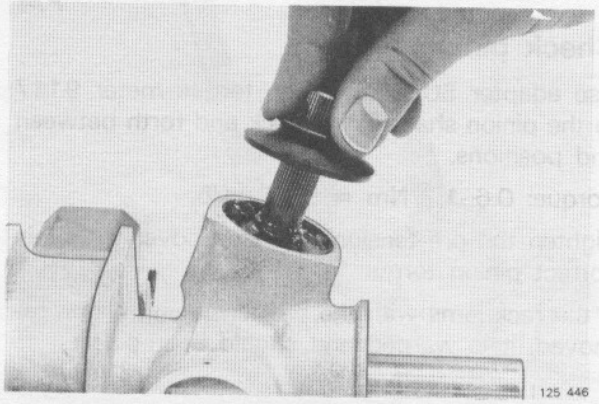


F9

Install lock plate and pinion nut.

Use wrench 5119.
Torque: 24±2 Nm = 17±1.5 ft.lbs.

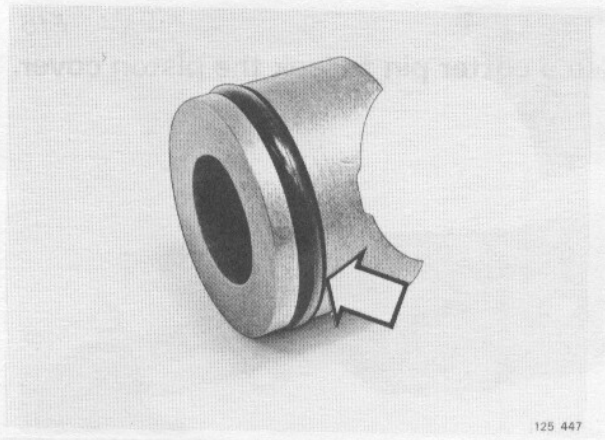
Lock plate should always be used, also if it was missing at disassembly. Lock the lock plate tab.



F10

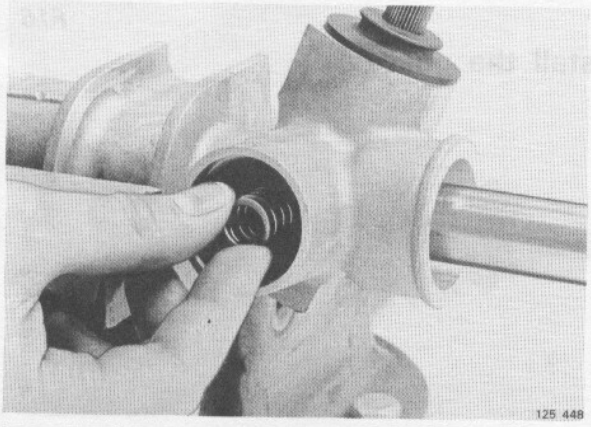
Fill grease and install the dust seal.

Fill the space on top of the nut with the grease, P/N 1161001. Install the dust seal.



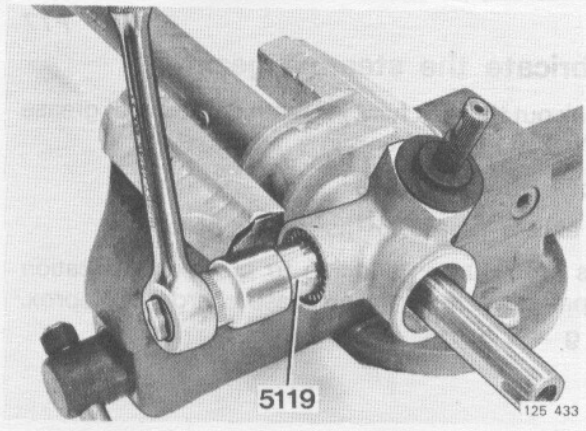
F11

Install a new O-ring on the pre-tensioning piston.



F12

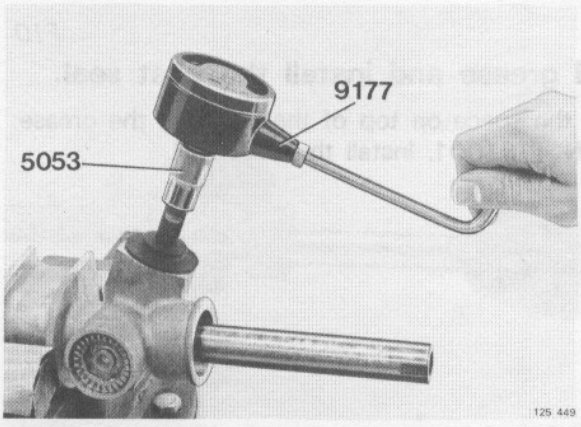
Lubricate the pre-tensioning piston. Install piston and spring.



F13

Install the cover for the pre-tensioning piston.

Use wrench 5119. Do not tighten the cover fully.



F14

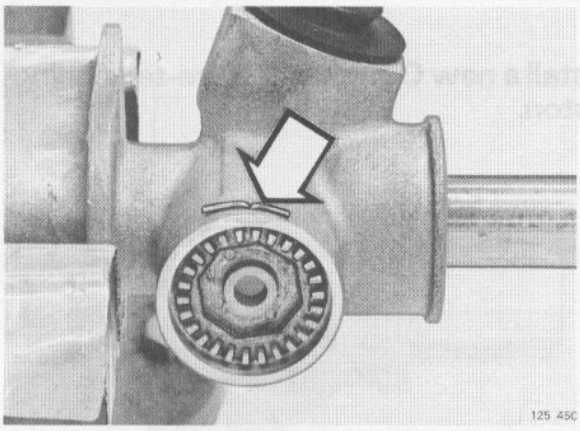
Check pinion torque.

Use adapter 5053 to attach torque meter 9117 to the pinion shaft. Crank back and forth between end positions.

Torque: 0.6–1.7 Nm = 5–15 in.lb.

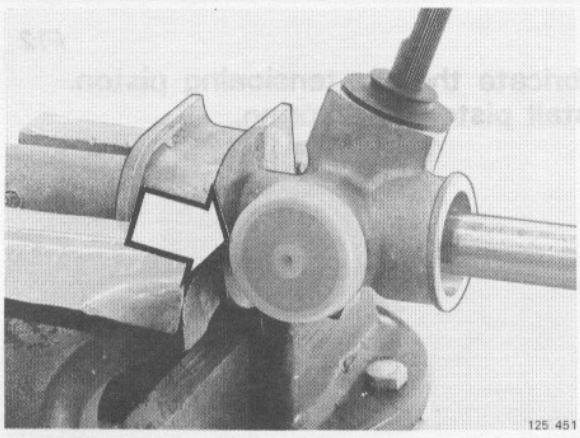
Tighten the pre-tensioning piston cover to obtain correct pinion torque.

If the rack jams with the pre-tensioning piston removed, it is warped and should be replaced.



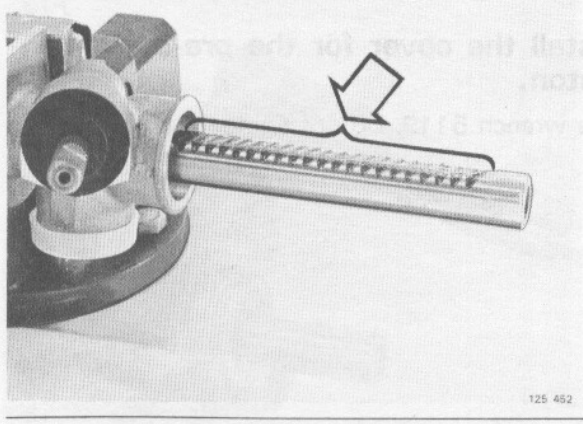
F15

Use a cotter pin to lock the piston cover.



F16

Install the dust seal.



F17

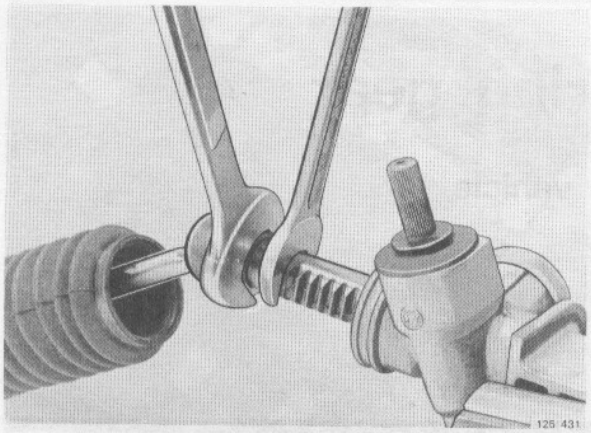
Lubricate the steering gear.

Crank out the rack fully. Fill teeth spaces with grease P/N 1161001. Crank in the rack.

Repeat this procedure.

Fill excess grease in the rubber bellow.

This procedure in addition to previous lubrication of parts will result in a grease charge of approx. 75 g = 2.5 ozs.

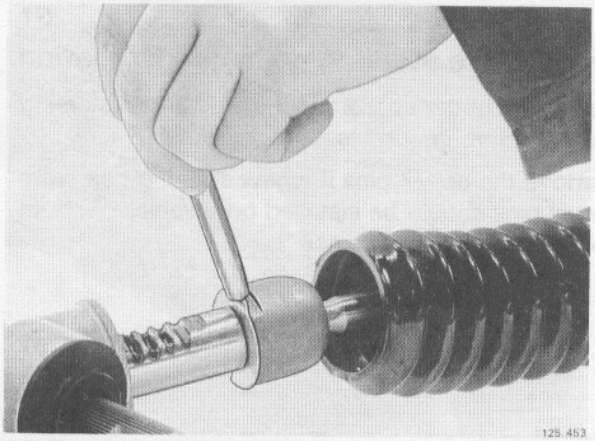


F18

Install steering rods.

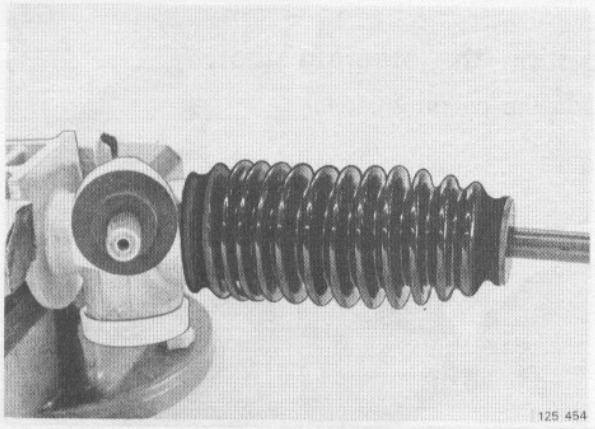
Use new lock washers. Use a 22 mm = 7/8" wrench to hold on the outermost tooth of the rack.

Use a 27 mm = 1–1/16" wrench to tighten the joint.



F19

Lock the washers.

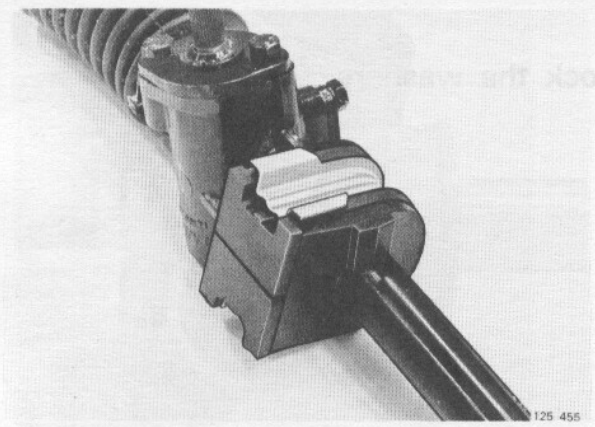


F20

Install the rubber bellows.

Manual steering gear

Installation on vehicle

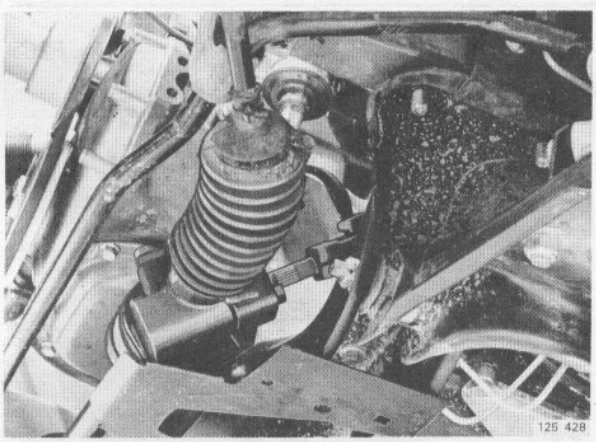


G1

Prepare the steering gear for installation.

Install the rubber spacers and plates at the steering gear attachment points.

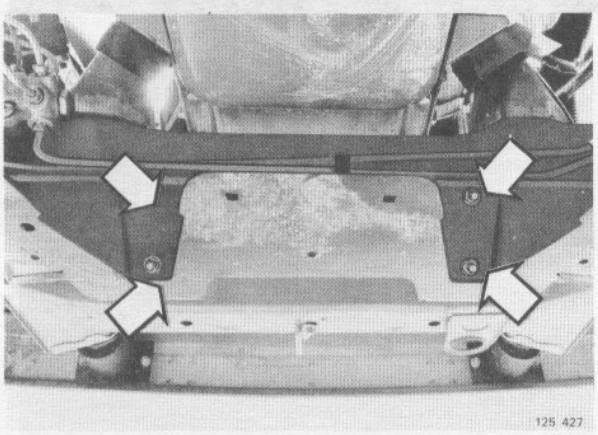
Remove the dowel pins if a new steering gear with dowel pins should be installed on a vehicle without holes for the dowel pins.



G2

Position the steering gear.

Guide the pinion shaft in.

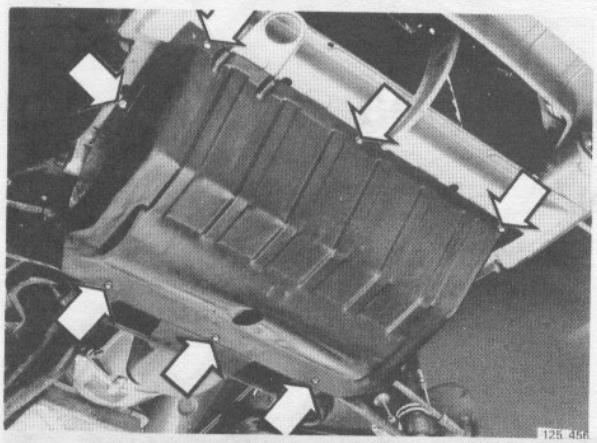


G3

Attach the steering gear to the front axle member.

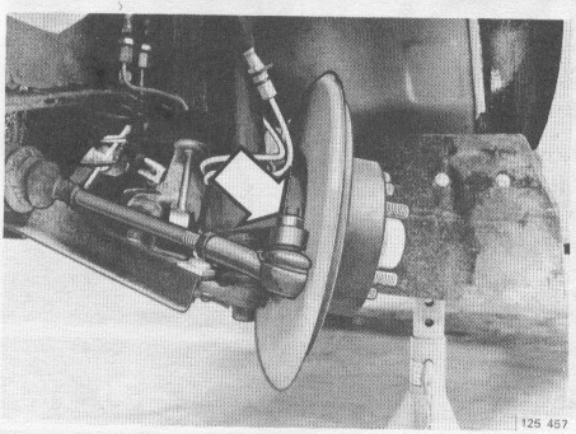
Make sure the U-bolts are aligned in the plate slots. Install flat washers and nuts.

Torque: 20±5 Nm = 14±4 ft.lbs.



G4

Install the splash shield under the engine.



G6

Attach the steering rods to the steering arms.

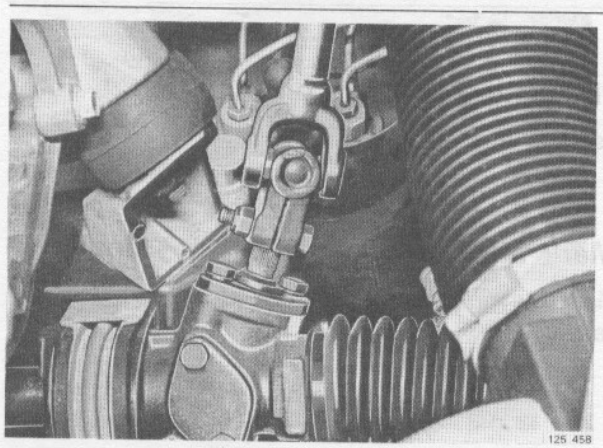
Torque: 60±10 Nm = 44±7 ft.lbs.

G6

Install front wheels, lower vehicle.

Use the marks to install the wheels on previous locations.

Torque: 120±20 Nm = 88±15 ft.lbs.



G7

Tighten the steering shaft joint.

Torque: 25±5 Nm = ft.lbs.

Check/adjust the steering gear according to instructions in op. A25–A34, this manual.

G8

Check/adjust toe-in.

Use rust protective oil to protect the steering rod threads.

Lock nut torque:

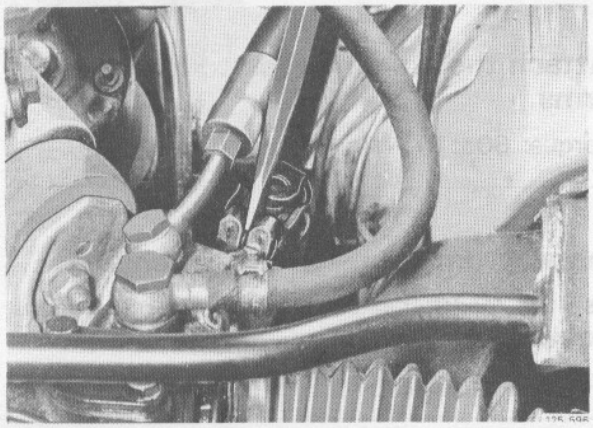
70±10 Nm = ft.lbs.

Power steering gear

Removal

Special tool:

5043 tie rod end puller



H1

Disconnect the steering shaft flange at the steering gear.

Remove the clamp screw. Use a screwdriver to open the flange.

H2

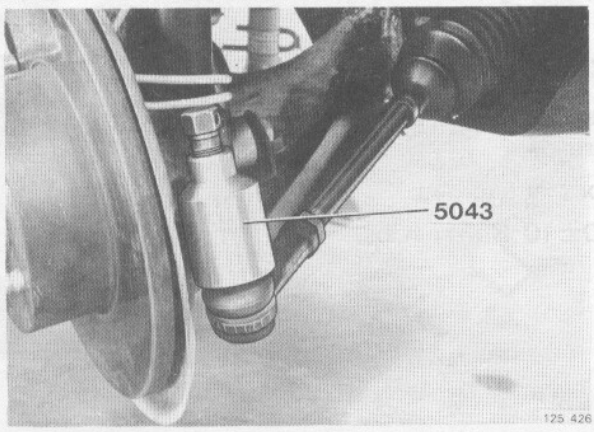
Place the front end on stands.

Use the front jack supports.

H3

Mark and remove the front wheels.

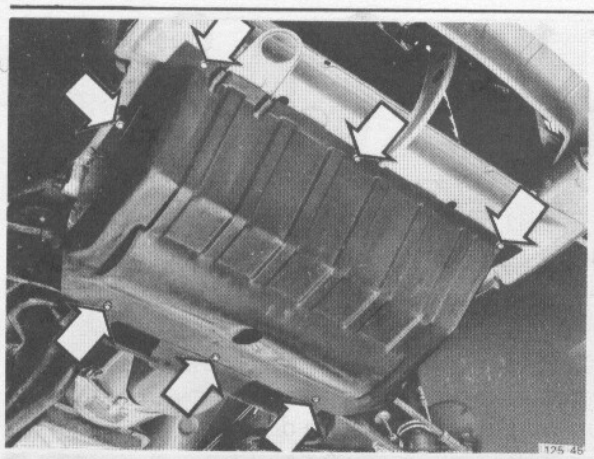
Mark the rim relative to the screws to avoid re-balancing.



H4

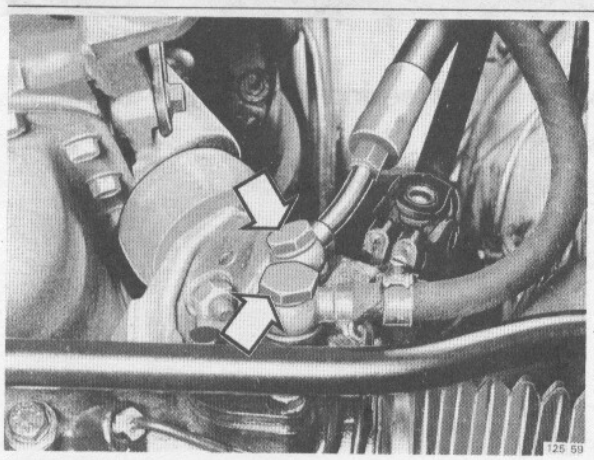
Disconnect the tie rod ends.

Remove the retaining nuts. Use tool 5043 to disconnect the tie rod ends.



H5

Remove the front guard plate.

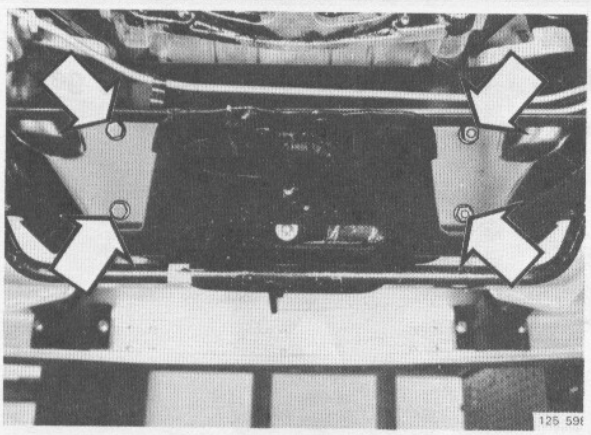


H6

Disconnect the hydraulic hoses at the steering gear.

On 260 late production, the clamp retaining the pressure hose at the front axle member must be removed.

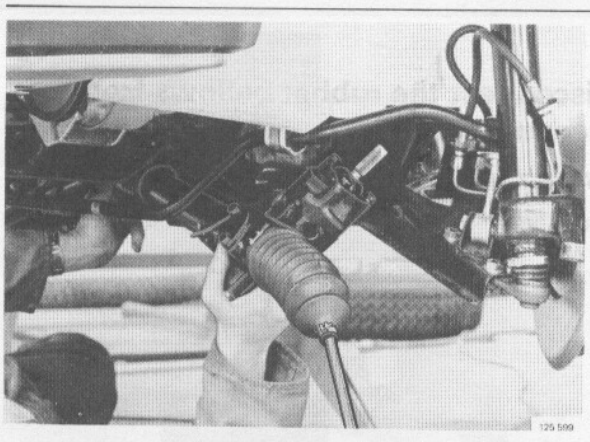
Install protection plugs in the hose connections.



H7

Remove the steering gear.

Remove the retaining screws. Remove the steering gear. Save the spacers.



H8

Take out the steering gear.

Pull the steering gear down until free from the steering shaft joint. Then take it out on the left side.

Save the dowel pins.

Power steering gear type Cam Gear.

Disassembly

Special tools:

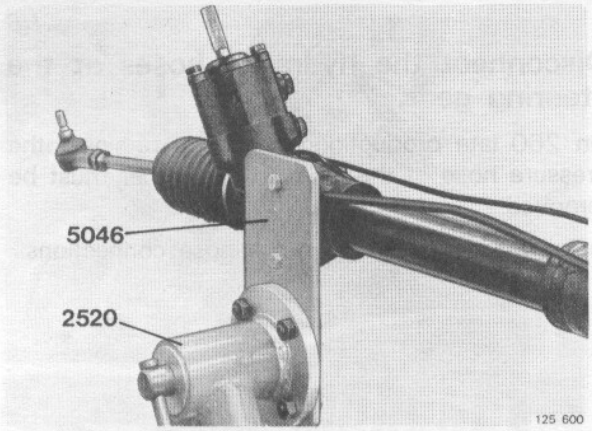
1801 Pull hammer
2520 Work stand
5046 Fixture
5049 Sleeve

Cleanliness

CAUTION

Do not allow dirt or foreign matter to come in contact with power steering components. Contamination will cause malfunction of the system or leaks causing unnecessary repairs.

Repairs to the power steering system should be accomplished in a dirt and dust free area. Clean components thoroughly before disassembly.

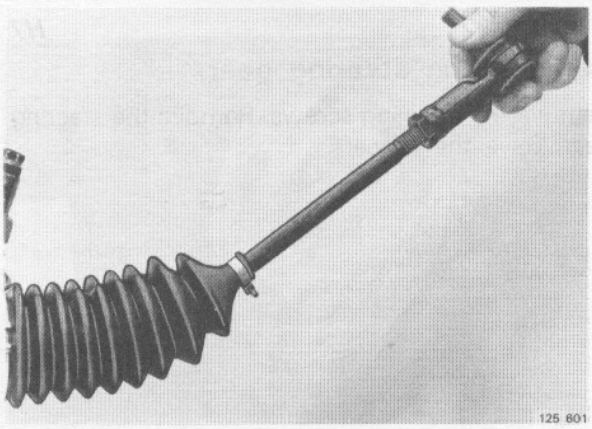


I1

Install the steering gear on a stand.

Use work stand 2520 and fixture 5046.

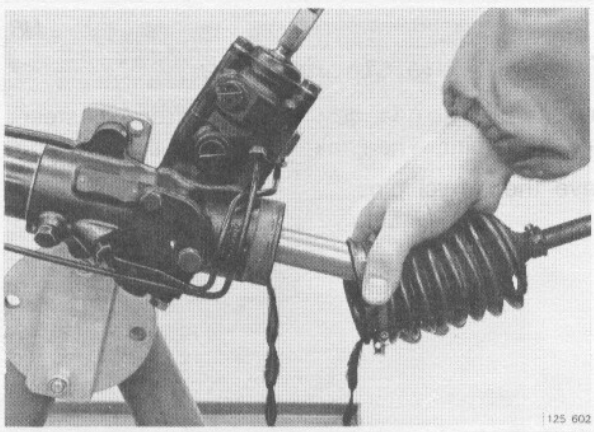
Use a U-bolt from the vehicle.



I2

Clean the exterior of the steering gear.

Check inner and outer joints for wear

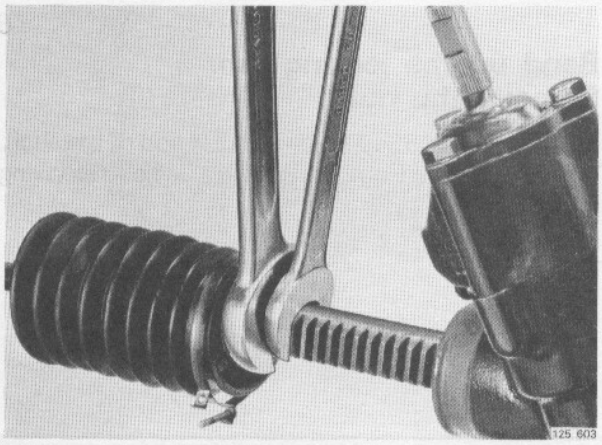


I3

Disconnect the rubber bellows from the steering gear.

Drain the lubricant.

Early type steering gears: collect the oil in a pan.

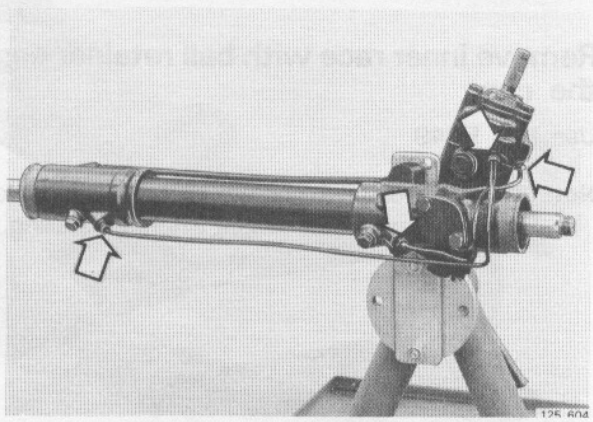


I4

Remove the tie rods.

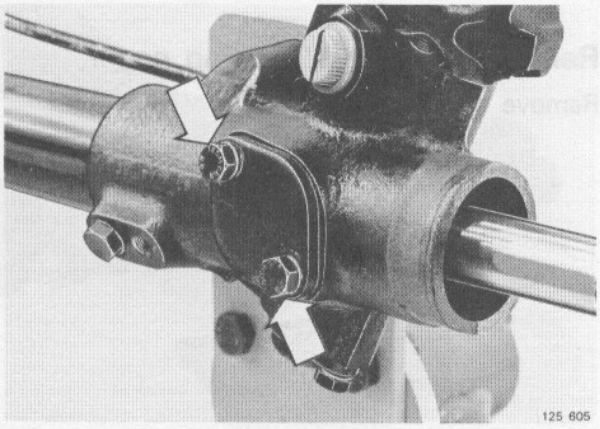
Use a 7/8" wrench to hold the rack on the outermost tooth.

Use a 30 mm 1–3/16" wrench to turn the joint.



I5

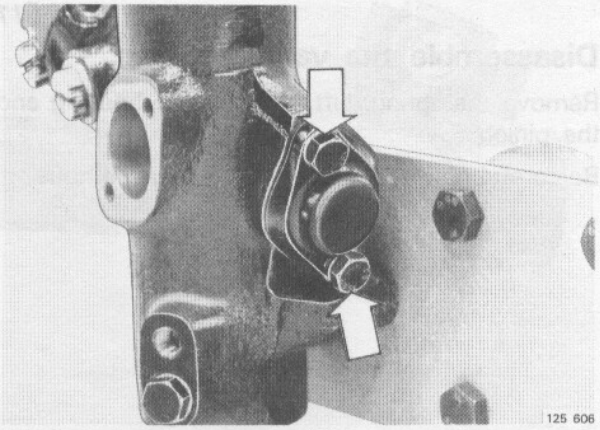
Remove the oil tubes.



I6

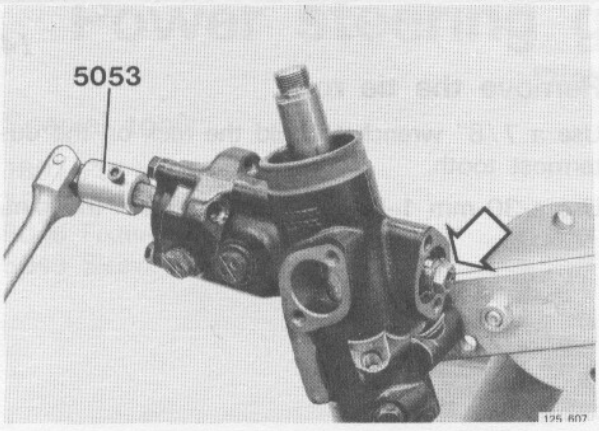
Remove the pre-tensioning device.

Remove cover, piston, O-ring and spring.



I7

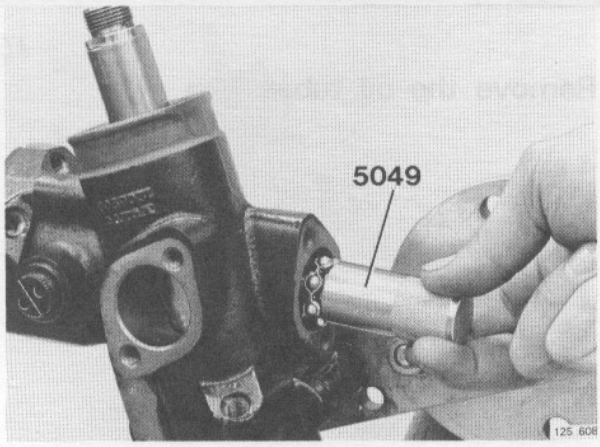
Remove the lower pinion cover.
Remove the spacer sleeve.



I8

Bend up the locking tab.
Remove the nut.

Use adapter 5053 to hold the outer end of the shaft. The valve should not move axially when removing the nut.

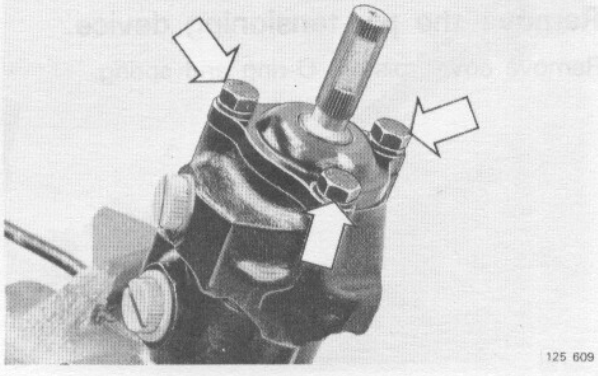


I9

Remove inner race with ball retainer and the cup.

Use tool 5049

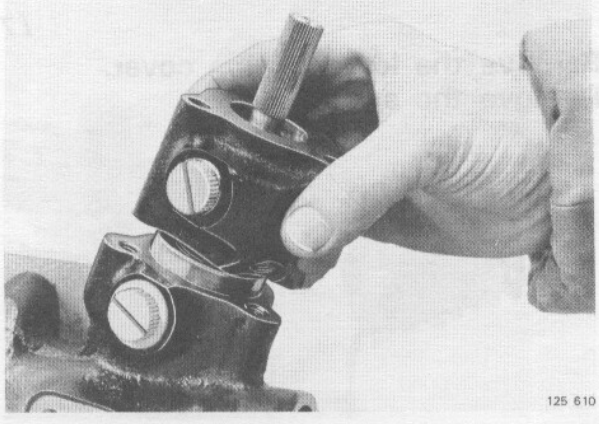
Note: be sure to count the number of turns in order to obtain same pinion height when reinstalling.



I10

Remove the valve housing cover.

Remove the outer dust seal.

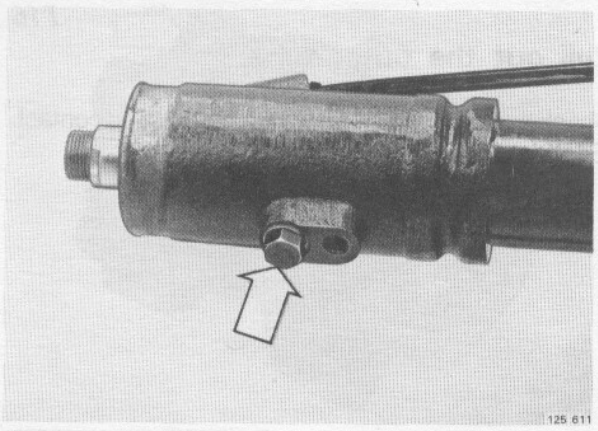


I11

Disassemble the valve housing.

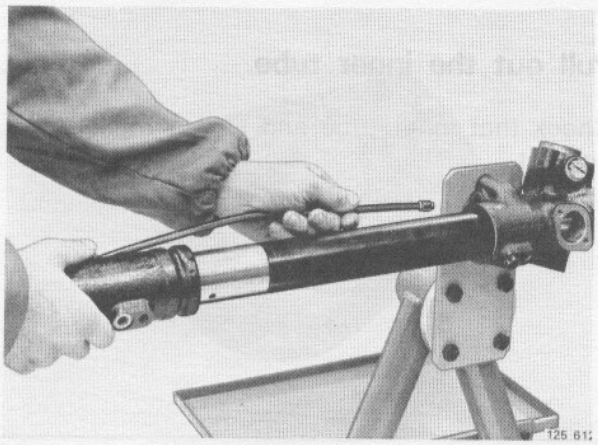
Remove the spring. Lift up the valve housing and the pinion.

Be careful not to damage valve and valve housing.



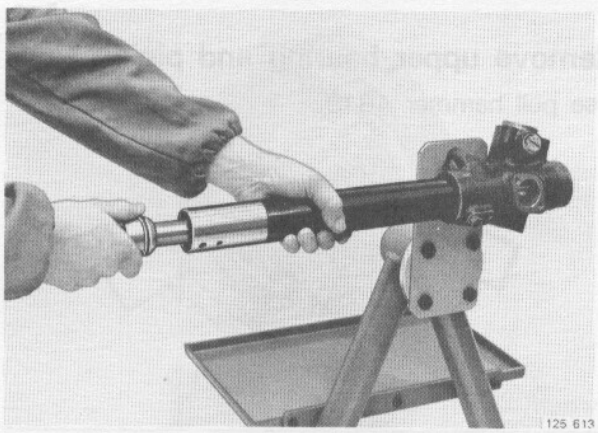
I 12

Remove the lock screw for the right side housing. (note aluminum spacer washer)



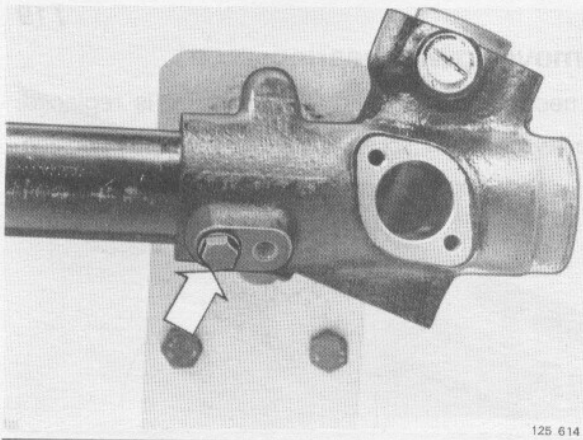
I 13

Pull off right side housing and connecting tube.



I 14

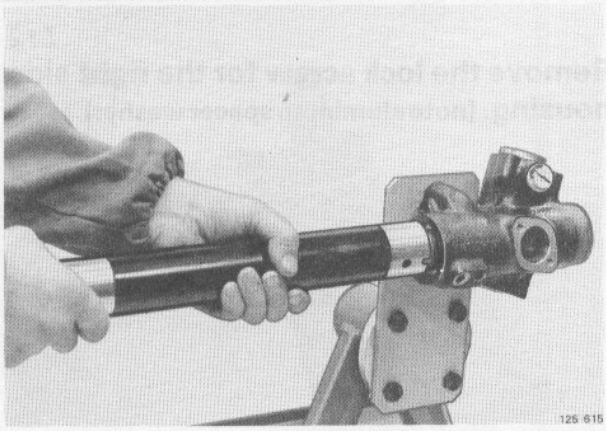
Pull out the rack and pinion sleeve.



I 15

Remove the lock screw for the left side housing.

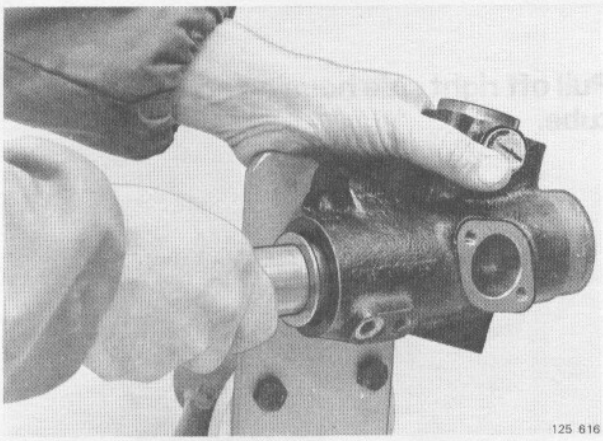
Note: special sealing washer with rubber insert.



I 16

Pull out the outer tube.

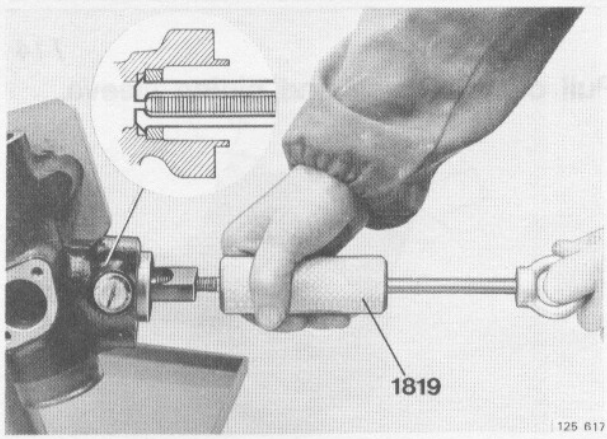
Check that outer tube and O-ring make good contact. (Slight resistance when removing).



I 17

Pull out the inner tube.

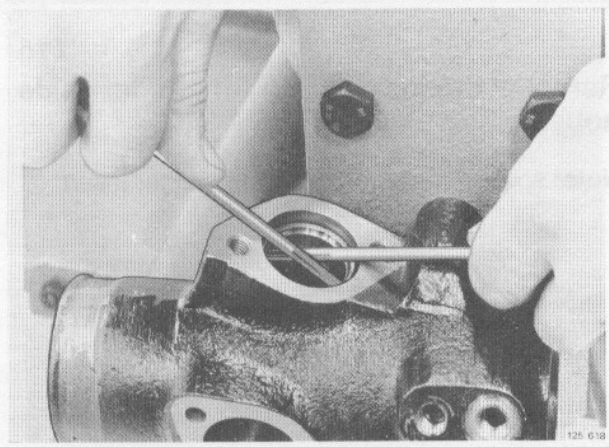
Check that inner tube and O-ring make good contact.



I 18

Remove upper bearing and pinion seal.

Use pull hammer 1819.

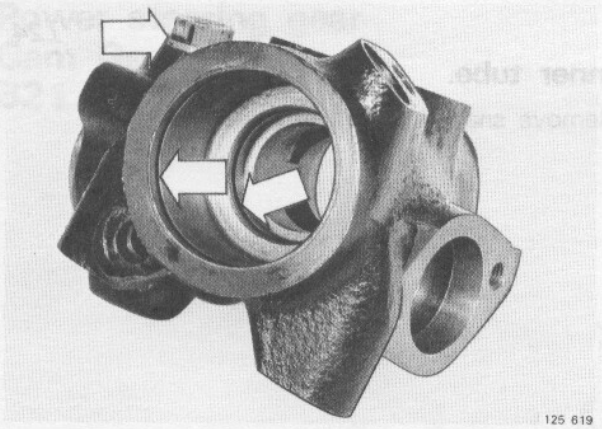


I 19

Remove lower bearing race.

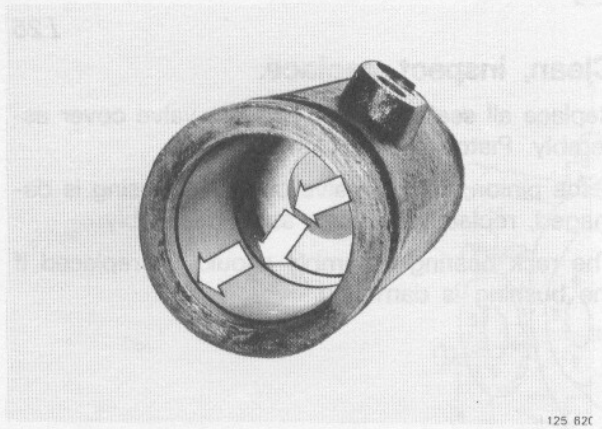
As necessary and only if the bearing is replaced.

Use two narrow screwdrivers to remove the race.



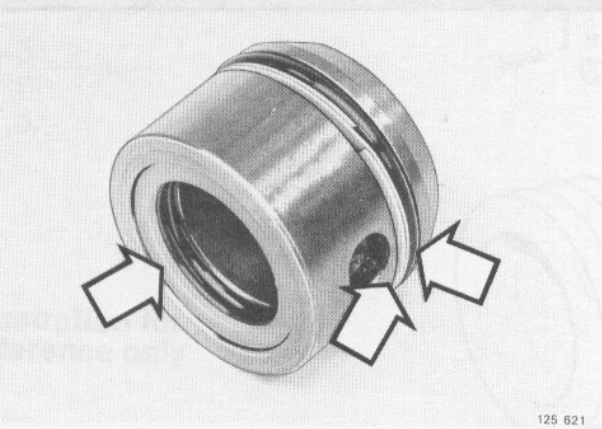
I20

Remove the left housing from the fixture. Remove the O-rings and the protection plug.



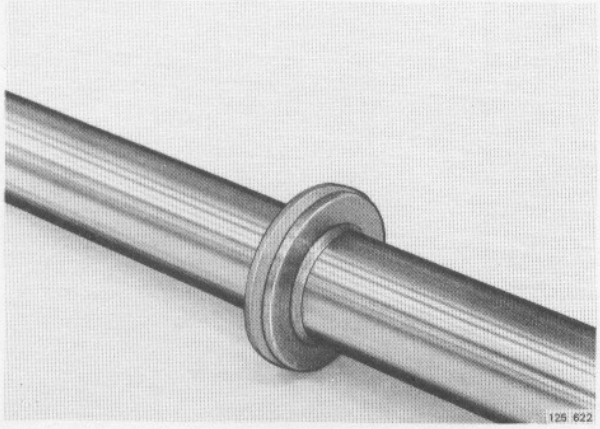
I21

Right housing: remove O-rings and spacer sleeve.



I22

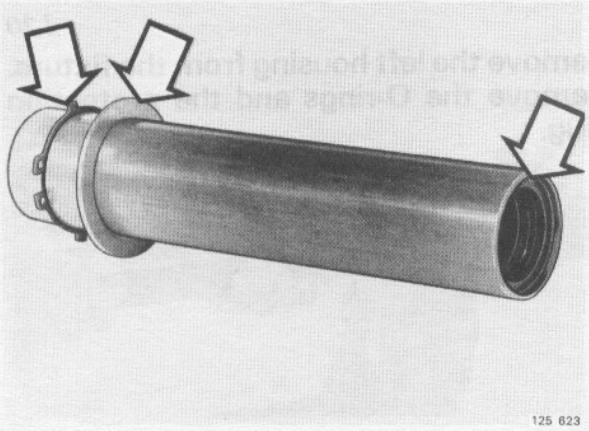
Bearing sleeve: remove inner and outer seals and O-rings.



I23

Piston seal.

Replace if damaged or if the vehicle mileage exceeds 40,000 km (25,000 miles).



125 623

I24

Inner tube.

Remove snap ring, spacer washer and seal.

125 624

I25

Clean, inspect, replace.

Replace all seals, O-rings and the valve cover assembly. Piston seal: see step I23.

If the pinion, control valve or valve housing is damaged, replace the parts as an assembly.

The rack bearing assembly should be replaced if the bushing is damaged.